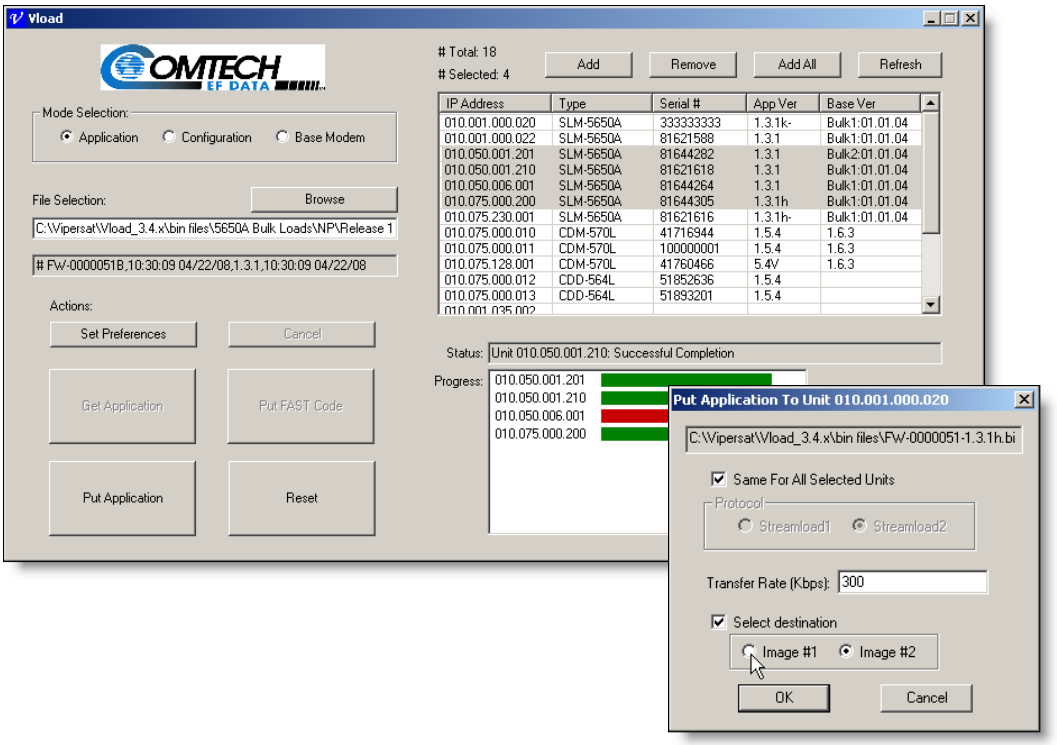
Vipersat Load Utility

VLoad v3.5.x



User Guide

Part Number MN/22117 Revision 1

Vipersat Load Utility

VLoad v3.5.x

User Guide

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1	10/14/10	Revisions for software version 3.5.x product release. **New features:** *Modem Config File*: Compatibility with VMS data file type; Write base modem parameters Put option for Streamload1. *Set Preferences*: New Unrestricted mode option available for Put file validation inhibit. *Codecast*: Cancel sends abort command to modem; New Send Codecast Termination reset option.

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CHAPTER

1

GENERAL

How to Use This Manual

This manual documents the features and functions of the Vipersat Load Utility software application, and guides the user in how to use this product in a Vipersat network and in a Digicast network.

Workstation users, as well as network administrators and operators responsible for the configuration and maintenance of the Vipersat satellite network, are the intended audience for this document.

Manual Organization

This User Guide is organized into the following sections:

Chapter 1 — General

Contains VLoad product description, customer support information, and manual conventions and references.

Chapter 2 — VLoad Installation

Covers the steps for installing the VLoad software application on a host PC/ workstation.

Chapter 3 — Using VLoad in Vipersat Mode

Describes using VLoad for acting on the Application and Base Modem firmware as well as the Configuration parameter file for selected VMS controlled modems.

Chapter 4 — Using VLoad in Digicast Mode

Describes using VLoad for updating the firmware and tuner and PID settings, as well as setting transmission parameters for selected Digicast receivers.

Appendix A — Glossary

A glossary of terms that pertain to Vipersat satellite network technology.

Conventions and References

The following conventions are utilized in this manual to assist the reader:

Note: Provides important information relevant to the accompanying text.

Tip: Provides complementary information that facilitates the associated actions or instructions.

Caution: Provides explanatory text that notifies the reader of possible consequences of an action.

Warning: Provides precautionary text that describes a potentially hazardous situation. Failure to take or avoid a specified action may result in damage to equipment.

The following documents are referenced in this manual, and provide supplementary information for the reader:

- *Vipersat CDM-570/570L User Guide* (Part Number MN/22125)
- *Vipersat CDD-56X Series User Guide* (Part Number MN/22137)

- *Vipersat SLM-5650A User Guide* (Part Number MN-0000035)
- *Vipersat Management System User Guide* (Part Number MN/22156)
- *Vipersat CDM-570/L, CDD-56X Parameter Editor User Guide* (Part Number MN-0000038)
- *Vipersat SLM-5650A Parameter Editor User Guide* (Part Number MN-0000041)

Product Description

Introduction

VLoad, the Vipersat Load Utility, is a comprehensive tool for managing and distributing application, configuration, and identification information for the modem/routers in a Vipersat network.

VLoad is a stand-alone program which runs on a Microsoft Windows-based workstation. Using VLoad, you can get (read) files from target Vipersat modems and store the resulting data in files on your workstation. You can then take these stored files and put (write) them to a targeted Vipersat modem.

The VLoad Utility performs many of the functions available through the Vipersat Management System (VMS) and supports VMS by allowing the system administrator to store (backup) the application, configuration and identification files used by every modem on a Vipersat network.

This function can be used to recover from equipment failure, for example, by uploading the failed equipment's configuration and application program to its replacement from the stored files.

In addition, VLoad can distribute updated firmware to network modems as it becomes available and update the FAST feature codes as new features are purchased.

For detailed information on the VMS program, refer to the *Vipersat Management System User Guide*.

VLoad Features

The VLoad utility software has the following features:

- Transmits (Put) and/or Retrieves (Get) an application image (firmware) to/from Vipersat units.
- Transmits (Put) a FAST Feature Code to a Vipersat unit.
- Transmits (Put) and/or Retrieves (Get) as well as Edits a configuration (parameter) file for a Vipersat unit.
- Transmits (Put) base modem application image in binary format to one or more target Vipersat units.
- Specifies base modem image to run upon unit reset.

- Refreshes unit information such as configuration and application versions, image versions, and FAST features.
- Supports Consecutive, Concurrent, Codecast, Digicast, and Unrestricted preferences.
- Unit Selection List displays network units that can be added or removed for a given action.
- Progress Area displays color-coded progress bars.
- Event logging of VLoad activity shows action taken and corresponding results.

New in this Release

v3.5.x Release

- New *Unrestricted* preference setting to support modem units that do not yet have a recognized file type; file validation is inhibited during Put operations.
- VMS-compatible modem configuration files (*.vipersat-modem-configuration*) are now accepted. This file type can be selected and converted for Put operations, as well as created and saved with Get operations.
- When using Streamload1 (CDM-570/L, CDD-56X) Put operations, the parameter set can be pushed from the NP card to the base modem using the new *Write Base Modem Parameters* option.
- When Put operations are performed in Codecast mode, the Cancel command now includes a Codecast abort command that is sent to the targeted modem(s). In addition, an abort command can be issued using the new *Send Codecast Termination* setting that is available during a Reset operation.

Customer Support

Contact Information

Contact Comtech Vipersat Networks Customer Support for information or assistance with product support, service, or training on any Vipersat product.

Mail: 3215 Skyway Court
Fremont, CA 94539
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Phone: 1+510-252-1462

Fax: 1+510-252-1695

Email: supportcvni@comtechefdata.com

Web: www.comtechefdata.com

Reader Comments / Corrections

If the reader would like to submit any comments or corrections regarding this manual and its contents, please forward them to a Comtech Vipersat Customer Support representative. All input is appreciated.

CHAPTER

2

VLOAD INSTALLATION

System Requirements

VLoad can be installed on any workstation with the following minimum configuration. The Vipersat Load Utility software should be installed on an industry-standard computer workstation running Microsoft Windows 2000 or later operating system.

The minimum hardware configuration required is:

- Pentium or later (or equivalent) processor
- 128 Mbytes of RAM minimum (depending on the operating system used)
- 16 bit color or higher video capability
- Network interface card with an IP stack

For the most current system requirements, refer to the *VLoad Release Notes*.

Using VLoad with Windows Firewall

Depending on the Windows configuration of the host PC, security warning messages may appear when running VLoad due to the Windows firewall that monitors the communications passed over the network. If necessary, the firewall settings can be adjusted to eliminate these messages.

Installing VLoad

The VLoad program can be installed in one of two ways:

- Copy the VLoad file set to the local C: drive.
  This method is acceptable for Vipersat users.
- Copy the VLoad Installation file to the local C: drive and launch the VLoad Setup Installation Wizard. The wizard guides the user in creating a program folder accessible from the Start menu, as well as the option of creating a shortcut for the desktop.

  This method creates an xml data file and registry entries for application data that are used by Digicast. Therefore, Digicast users should use this installation method.

Copying the VLoad File Set

The VLoad application is distributed on a program CD with the following files:

- VLoad v3.x.exe – Application program
- VLoadSetup v3.x.exe – Program Installer
- Streamload1.dll – Streamload protocol library for CDM-570/L, CDD-56X
- Streamload2.dll – Streamload protocol library for SLM-5650A
- ParamEdit.dll – Parameter Editor library files (multiple)
- VLoad v3.x UG.pdf – Program User Guide
- VLoad v3.x Release Notes.doc

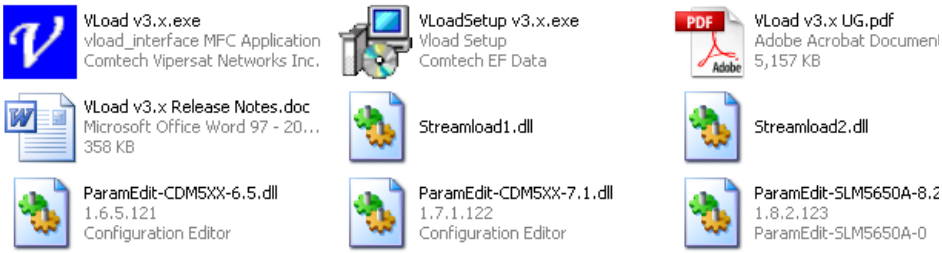

Figure 2-1 VLoad File Set example

Create a new VLoad directory on the workstation that will be used to run the VLoad utility, then copy the VLoad file set to this directory.

The VLoad.exe file runs the VLoad program and displays the graphical user interface. The ParamEdit.dll files are utilized when editing a Vipersat modem's

configuration parameters using the capabilities described in the *Vipersat Parameter Editor User Guide*.

This completes the initial installation of VLoad. During the operation of VLoad, additional files will be created to store the parameter sets of the network modems/routers.

Using the Installation Wizard

Copy the VLoad Installation file to the local C: drive of the workstation.

Figure 2-2 VLoad Installation File

Open the Comtech EF Data **VLoad Setup Wizard** by double-clicking on the **VLoadSetup** icon. The initial window of VLoad Setup will appear, as shown in figure 2-3, below.

Figure 2-3 VLoad Setup Wizard, Initial window

Click on the **Next** button to continue with program installation.

Destination Location

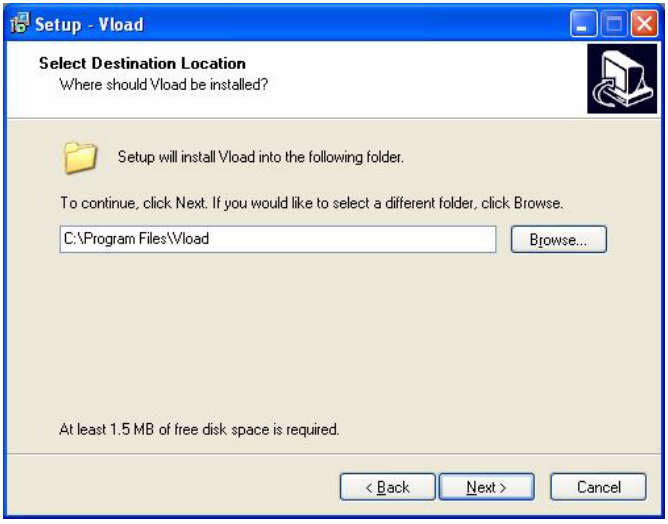

Figure 2-4 Select Destination Location, VLoad Setup

Select the destination for the VLoad files as they are installed. If the user does not specify a destination, the installation program provides a default.

Click the **Next** button to proceed.

Select Start Menu Folder

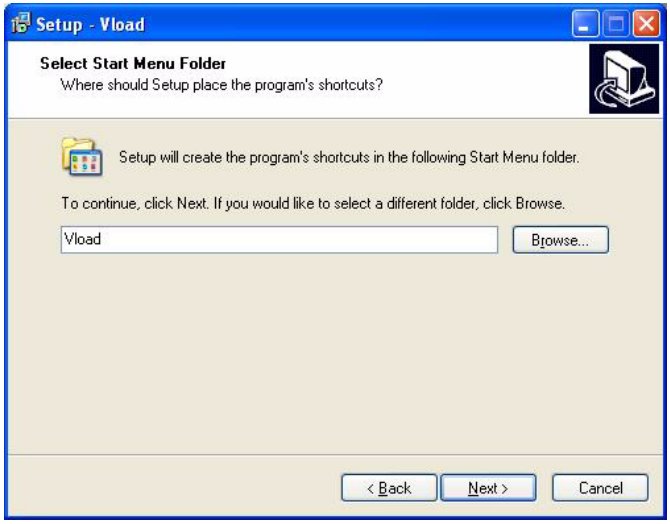

Figure 2-5 Select Start Menu Folder, VLoad Setup

Select the name of the folder located in the Start Menu. If the user does not specify a name, the installation program provides a default.

Click the **Next** button to proceed.

Create a Desktop Icon

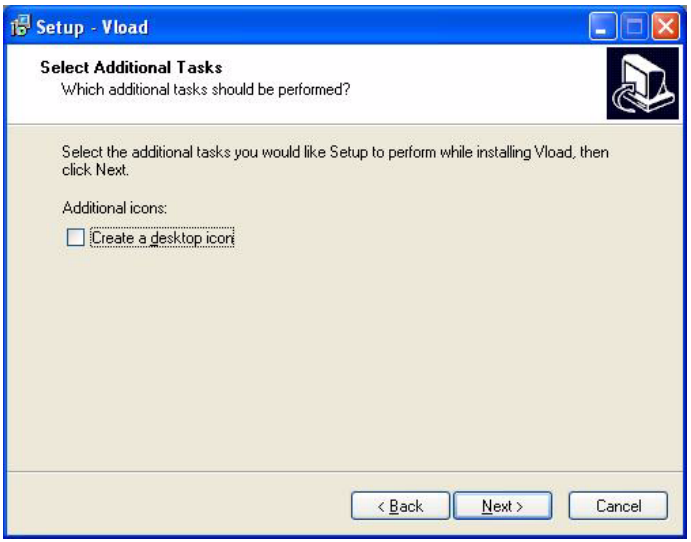

Figure 2-6 Create Desktop Icon, VLoad Setup

Click the **Create a desktop icon** box to instruct the installation program to automatically create a shortcut on your desktop, if desired.

Click the **Next** button to proceed.

Ready to Install

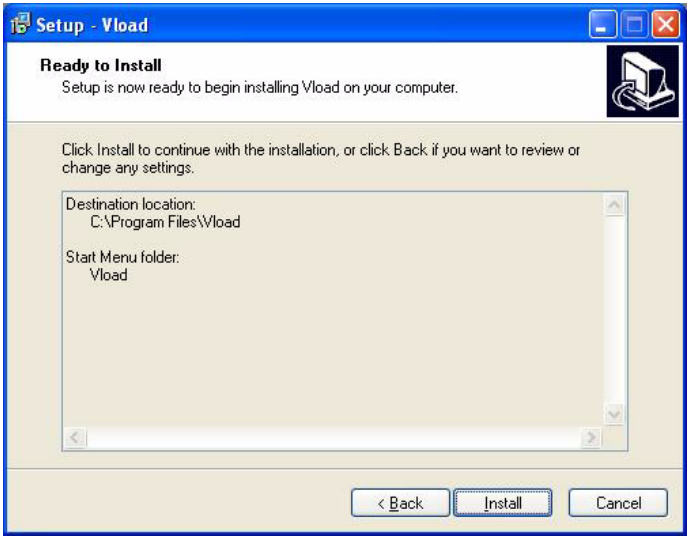

Figure 2-7 Ready to Install dialog, VLoad Setup

The **Ready to Install** window provides a synopsis of the installation including the destination for the installed files and the name of the Start Menu folder. This window is the last opportunity for the user to terminate installation of the program.

Ensure that all information presented in the synopsis is correct and click **Install** to complete the installation.

Completing Installation of VLoad

Upon a successful installation of the VLoad program, the Completing Setup window will appear.

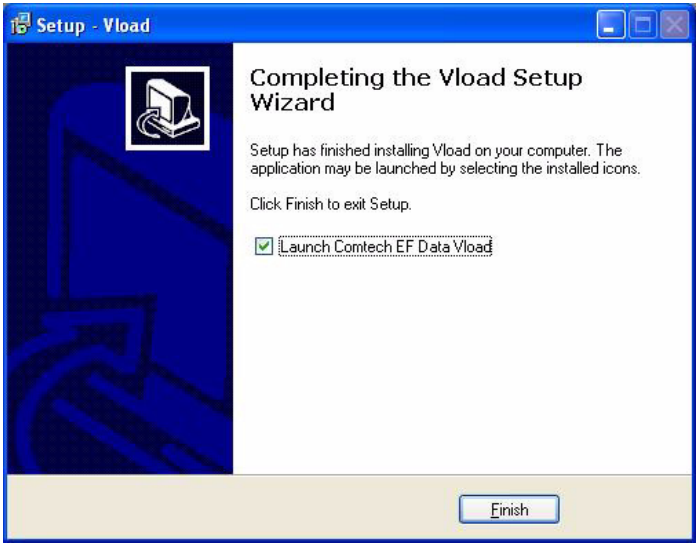

Figure 2-8 Completing Installation, VLoad Setup

Select the **Launch Comtech EF Data VLoad** box to launch VLoad after exiting the installation setup program.

Click the **Finish** button to exit VLoad Setup.

CHAPTER

3

USING VLOAD — VIPERSAT MODE

This chapter covers using VLoad with a *Vipersat* network. For a *Digicast* network, refer to Chapter 4, “Using VLoad — Digicast Mode”.

In Vipersat mode, VLoad only supports modem/routers with the Vipersat feature enabled. Attempts to use VLoad with network units that are not Vipersat-enabled will result in a protocol error. For more information on enabling the Vipersat feature, refer to the user documentation for that unit.

NOTE

Note: Refer to the *VLoad Release Notes* for current information on what features are supported for each modem type.

Main Window Description

This section describes how to use the controls and capabilities that are available in VLoad. The five functional areas of the **Main Window** are shown in figure 3-1, below.

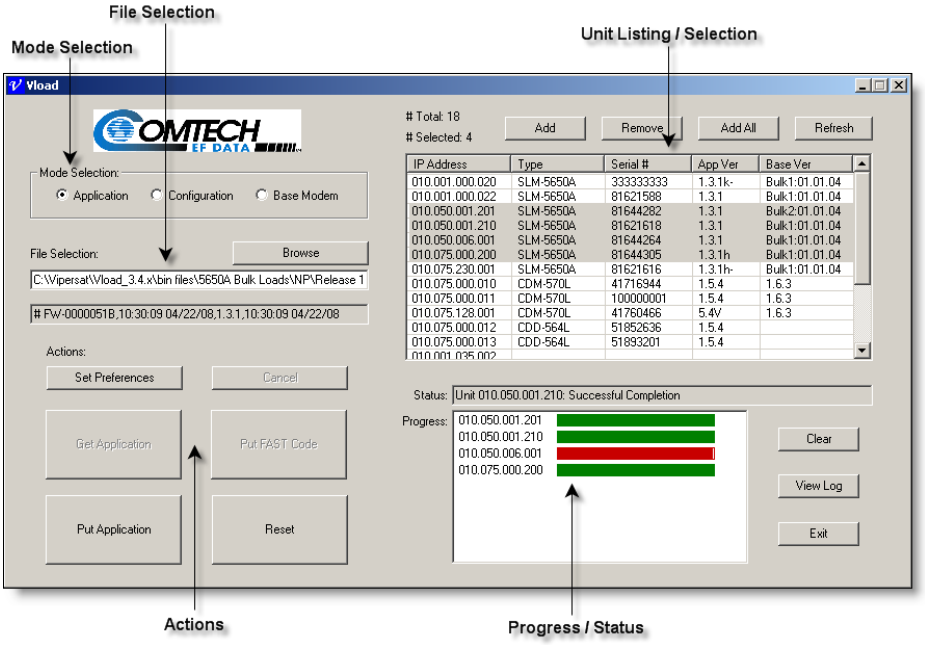

Figure 3-1 VLoad Main Window, Functional Areas

About VLoad

Clicking on the *V* icon in the upper left corner of the main VLoad window title bar will display a pull-down menu as shown in figure 3-2.

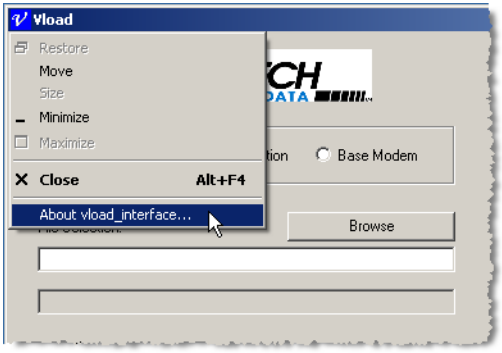

Figure 3-2 VLoad Pull-Down Menu

Click on **About vload_interface...** to open the **About VLoad** window, showing the version number for this edition of VLoad.

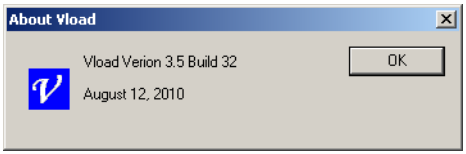

Figure 3-3 About VLoad window

Unit Listing / Selection Area

This area of the main window is used to add and remove units to/from the modem list for purposes of retrieving (Get) and/or replacing (Put) either the configuration file, the application image, or the base modem image for the modem(s). Detailed information for each modem in the list is also available for viewing. This information can be immediately updated with the use of the **Refresh** button.

Following a Refresh operation, VLoad creates and saves a simple text file named **VloadUnitList.txt** in the Windows directory *C:\Documents and Settings\<username>\Application Data\Vload*. This file can be opened with a text editor, and because it is comma-delimited, can be imported into a spread-sheet for offline use.

More details on how to use this area of VLoad are provided in the "Unit Listing and Selection" section on page 3-18.

Mode Selection Area

The specific functions of VLoad that are available for action on the listed modems vary depending on which *Mode* and *Preference* and what *Type* of unit is selected at that time.

- **Application** – This mode is used to Get and/or Put an application image (firmware) from/to the unit(s), as well as to Put a FAST Feature Code to the unit. The "Application Mode" section on page 3-23 describes Putting and Getting the binary (.bin) image file for a Vipersat modem.
- **Configuration** – This mode is used to Get and/or Put a configuration file from/to the unit(s), as well as to edit the Param file for a unit. The "Configuration Mode" section on page 3-32 describes Putting, Getting, and editing the configuration file (.txt) for a Vipersat modem.

The *Vipersat Parameter Editor User Guide* contains detailed information for using the Parameter Editor portion of VLoad to configure and optimize the Vipersat modems in your satellite network.

- **Base Modem** – This mode is used to Put a base modem image (firmware) to the unit(s) that are selected, as well as to select which image to run. The "Base Modem Mode" section on page 3-39 describes selecting and uploading a base modem image in binary format from a .bin file to one or more modem units.

Use the appropriate radio button in the **Mode Selection** block, shown at the top of the main window in figure 3-1, to select the mode of operation for VLoad.

File Selection Area

This area of the main window is used to either specify the file name and location for a Get operation to be saved to, or to select the desired file for a Put operation. A **Browse** button is available for locating the desired directory and file, or the desired path can be entered using the keyboard.

The file type used for both Application mode and Base Modem mode is binary (*.bin*). The file type used for Configuration mode is either text (*.txt*) or Vipersat (*.vipersat-modem-config*); the latter is a VMS-compatible file type. During a Get operation, the utility prompts for a file name and choice of the desired directory to save this file to; typically, this will be the same directory in which the VLoad.exe program file resides.

File Type and Naming

Since there can be more than one type of .bin file (e.g., CDM-570L Application file, CDD-564L Application file, Base Modem file), each type should be saved using a different name so that they can be easily identified. It is recommended that the .bin file names be based on the firmware release level for that file type. This is the convention that is used with the original files that are provided by Comtech EF Data.

For example, for a CDM-570/L modem, the Application file will have a name such as FW10875N.bin, and the Base Modem file will have a name such as FW10805Y.bin.

Also, a unique file name can be assigned to the Configuration parameter file for each unit for backup purposes.

VLoad has a smart feature that enables it to distinguish the various file types, and will not allow the wrong file type to be selected for a particular action. For example, VLoad will not allow the operator to select a router Application .bin

file when in the Base Modem mode. Similarly, in Application mode, a CDD-564L .bin file can not be Put to a CDM-570L modem.

This smart feature can be overridden by changing the Preferences setting to *Unrestricted*. See the "Unrestricted" section on page 3-7 for more about this preference.

There are two boxes in the File Selection area. The upper box is used to specify the path and filename. The lower box is read-only and displays additional information for the selected file, such as the file name or the modem type, and the time and date of creation. This information text may extend beyond the visible area of the box—use the right/left arrow keys to scroll through the text.

Actions Area

The buttons in the **Actions** area of the VLoad main window are used to select the actions for VLoad to perform. Other than the top two buttons, **Set Preferences** and **Cancel**, the available actions and the button's labels will change depending on the *Mode* selected in the **Mode Selection** area, the *Preference* selected in the **Actions** area, and the *Type* of modem unit that is selected in the **Unit Listing** area. These dependent button functions will be described in the three Mode Selection sections that follow.

The common Action button functions are described below.

Set Preferences

Clicking the **Set Preferences** button displays the **VLoad Preferences** dialog box shown in figure 3-4. Making selections in the radio buttons in this dialog will determine the Put and Reset method to be used when loading the firmware, configuration, or Fast Code to selected Vipersat modems.

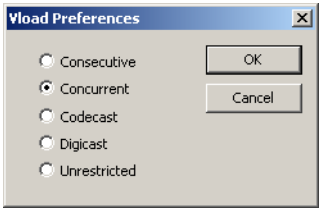

Figure 3-4 VLoad Preferences dialog

Consecutive

Selecting the **Consecutive** radio button instructs the VLoad utility to Put/Reset the data to the selected Vipersat modems sequentially. All selected Vipersat

modems in the network will receive the data in sequence in the order they are displayed in the unit listing / selection area shown in figure 3-1.

Concurrent

Selecting the **Concurrent** radio button instructs the VLoad utility to Put/Reset the data to the selected Vipersat modems using *n* different unicast streams all at the same time, each stream directed toward one unit. All Vipersat modems in the network will receive the data at the same time.

Note that this option requires that there be sufficient bandwidth available on the TDM outbound to handle multiple streams at the specified data transfer rate.

Codecast

Note: The Codecast preference selection only applies to a *Put* or *Reset* operation. A Get action does not use Codecast for the data transfer.

Codecast is not supported for the SLM-5650A.

Codecast uses a streaming multicast method to upgrade the modem firmware and/or the Param file. When the Hub TDM outbound capacity is limited, Codecast is a useful option for transferring/resetting data.

Caution: Codecast should only be used with a full understanding of its limitations, and only in situations where the potential benefit offsets the risks.

Selecting the **Codecast** radio button causes the VLoad utility to transfer the data to the targeted Vipersat modems without verifying the integrity of the data transfer. Thus, the data will not be re-sent in the event that the target modem receives a corrupted data block. However, the integrity of the file is checked by the receiving modem prior to writing the data to flash, so the worst case is that the file transfer will not have succeeded.

Codecast is received by all units configured to listen to the chosen multicast address:

- If no units are selected in the Unit Listing area (# Selected: 0), then all units associated with the multicast address will accept the transfer/reset.
- If specific units are selected, the list of these units is transmitted along with the file via multicast, and those targeted units that are not on the list will ignore the transfer/reset.

Using the Codecast preference will result in some alteration of window appearances, such as with the Actions area of the main window and with some of the dialogs.

Digicast

Selecting the **Digicast** radio button instructs the VLoad utility to present the set of windows and dialogs that are applicable for Digicast network products. For more information on this setting, refer to Chapter 4, “Using VLoad — Digicast Mode”.

Unrestricted

Selecting the **Unrestricted** radio button instructs the VLoad utility to Put the data to the selected Vipersat modems without performing a validation check. The validation check ensures that the source file is compatible with the modem type. This preference allows VLoad to be used with new modem models that have not yet been predefined in the utility. *This preference only affects Put operations*.

Following the completion of the unrestricted Put operation(s), it is recommended that the preference be returned to a setting for common operations.

NOTE

Note: Although this preference setting disables the file validation function in VLoad, a similar file validation function within the modem will prevent an incompatible image or configuration from being saved in that modem unit. Should an incompatible file be Put to a modem, a Streamload error will occur and the Put attempt will fail, as shown in figure 3-5.

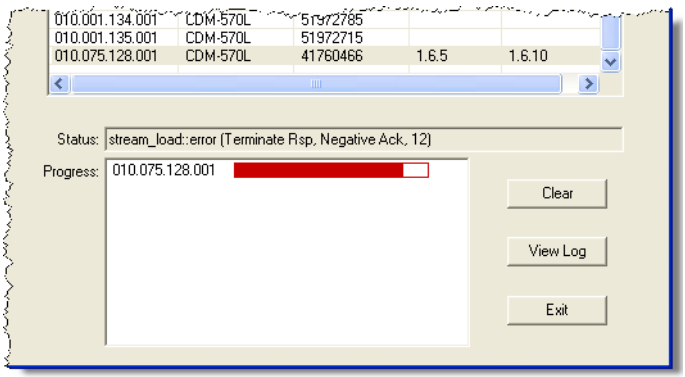

Figure 3-5 Put Streamload Error

Cancel

The **Cancel** button only becomes enabled during a Get or Put operation, and is used to cancel the transfer before it is completed. The rest of the time this button is disabled (grayed out).

NOTE

Note: The Cancel button cancels the communications between VLoad and the targeted unit(s). This means that a data transfer operation that is in prog-

ress will stop. However, if a Put operation has reached either the image flash burn phase or the router-to-base modem file transfer phase, executing a Cancel will terminate the unit status update to VLoad but will not end the current operation. This is indicated by the button label changing from Cancel to **Detach**.

The exception to this is for *Codecast* operations, where the Cancel command includes an abort command for the modem(s) to terminate the Codecast session.

Reset

The **Reset** button is used for resetting a unit, typically after a Put operation, to apply the new settings as specified in the dialog window that opens, as shown in figure 3-6. When using the *Codecast* preference setting, this button is labeled **Codecast Hard Reset**, and the dialog window appearance is as shown in figure 3-7.

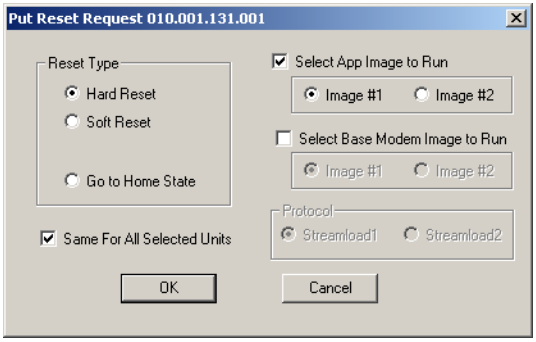

Figure 3-6 Put Reset Request dialog

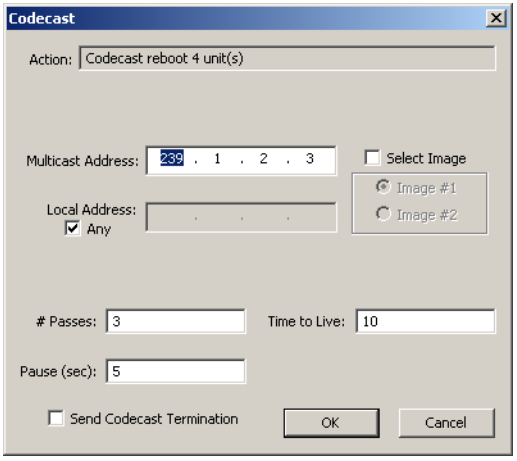

Figure 3-7 Codecast Reboot dialog

Caution: Never reset a unit (or units) during the image flash burn process of a Put operation. This will result in an incomplete and unusable modem image.

The Reset button is inactive (grayed out) during a transfer operation, as a safety precaution. However, in the event that a Put operation is canceled during an image flash burn, the Reset button will become active.

Reset Type

- **Hard Reset** – this reset is equivalent to a power-off/power-on cycle and reboots the unit.

  Note that a *Hard Reset* is the only available reset type when using **Codecast**.

- **Soft Reset** – this reset restarts all of the tasks in the application of the modem (e.g., STDMA, Auto-Switching, etc.); subset to a Hard Reset.
- **Go to Home State** – this reset forces the modem unit to the Home State configuration.

The modem image(s) that will be run following a Reset default to the current modem settings which can be viewed in the Unit Information window (see "Unit Information" section on page 3-18).

For **Put Reset Request**:

When Reset Type is **Hard**, Image selection is available. To change either the *Application Image to Run* or the *Base Modem Image to Run* on the modem, click on the **Select** check box to enable these settings.

If multiple units are selected for this action, the **Same For All Selected Units** check box will appear, providing the option to perform this Put to the group using the same specified settings.

The **Protocol** type will be automatically determined, unless the device type is unknown; in this case, either *Streamload1* or *Streamload2* can be selected.

For **Codecast Reboot**:

Enter the **Codecast Multicast Address** of the unit(s) to be reset. This parameter defaults to **239.1.2.4** since this is the Codecast Address of all Vipersat units when they are shipped from the factory.

If desired, the IP address of the network interface card (NIC) on the local host machine can be specified to be used for the multicast. This setting defaults to **Any**.

To change the *Image* to run on the modem, click on the **Select** check box to enable these settings.

Because Codecast utilizes multicast with no verification, the dialog displays the following IP multicast parameter settings:

- **# Passes** – the number of transmissions to each unit (default is 3).
- **Pause** – the time, in seconds, between transmissions (default is 5 sec).
- **Time to Live** – the maximum number of router hops/seconds to reach a unit before the data packet expires (default is 10). This parameter prevents possible looping of the packet transmission in the network.

These settings are editable; however, the default values are typically adequate for most networks.

The **Send Codecast Termination** setting enables the clearing of the Codecast port flag set in the targeted modem(s) for a recent Put operation that was not completed due to an event such as:

- An interruption caused by a crash/reboot of VLoad or the PC/ workstation.
- A Cancel attempt that was unsuccessful in aborting the session.

Status / Progress Area

The lower right area of the main VLoad window is known as the **Status**/**Progress** area, as shown in figure 3-1. This area provides status information for any actions that are executed on the modem units. Text information appears in the Status box, and real-time colored progress bar(s) are graphically displayed in the Progress box below.

Progress Bar Color Code

The progress bar is color coded to indicate the type of Put/Get file transfer in process. There are four colors associated with the progress bar and the colors will have slightly different meanings, depending on the transfer type and the success/failure of the transfer.

- **Red –** A red progress bar indicates an error has occurred during the **Put** file transfer, resulting in a failure. A *red outlined* progress bar is displayed when there is no response from the unit, or a connection failure occurred. A *solid red* progress bar is displayed when the error occurred after a connection was established. Refer to the event log file for details on the specific error/failure type.
- **Blue –** A *blue outlined* progress bar is displayed when VLoad is attempting to establish connection to the unit. A *solid blue* progress bar

indicates that there is a file transfer in process. A solid blue progress bar is also displayed upon completion of the **Refresh** process.

- **Orange –** An orange progress bar indicates that a flash memory burn is in process. Note that this process is only displayed for units using Streamload2 (e.g., SLM-5650A). A Get operation that is completed but is not saved will also result in an orange progress bar to alert the user.
- **Green –** A green progress bar indicates that the file transfer or action was successful.
- **Yellow –** A yellow progress bar indicates that a **Codecast** transfer is in progress or has been made. Since a Codecast transfer has no error detection or correction, there will never be an error condition shown with this transfer type.

  A sample Codecast Put operation is shown in figure 3-8. Note that the progress bars are yellow and that three tries to the same IP address are shown in progress. The sample Codecast is being made to a known bad IP address, but there is no error detected or displayed by VLoad.

  Yellow is also used for all Reset requests on modems running Application firmware version 1.5.3.3 or earlier, which are always unverified. For all SLM-5650A modems, as well as any other units running version 1.5.3.4 or later, Reset status will be displayed with red or green progress bars.

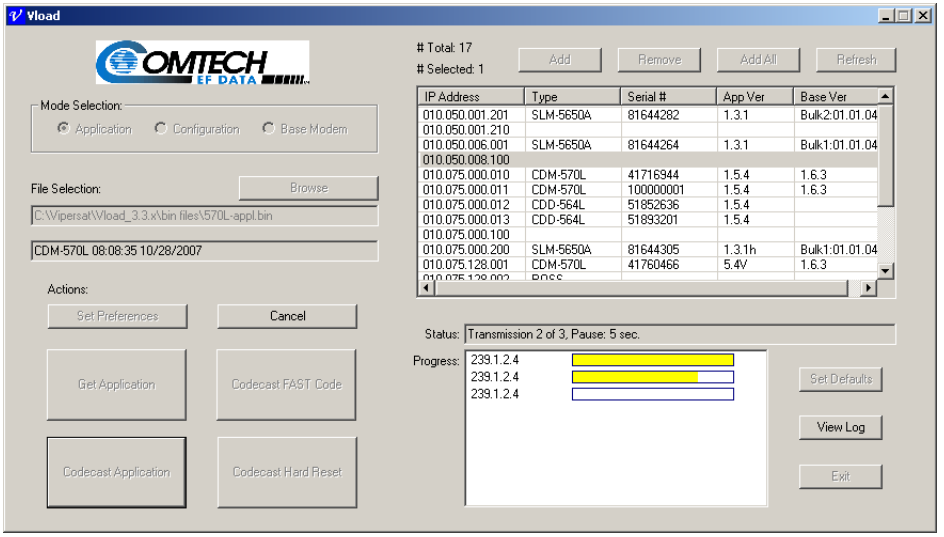

Figure 3-8 Codecast Application (Put) in Progress

Caution: Note that some actions, such as the Put command, may require several minutes to be performed. Once an action is initiated, do not attempt a subsequent action until the progress status (both the text information and the progress bar(s)) indicates that the first action is either completed, failed, or is terminated with the *Cancel* button.

Set Defaults / Clear

The upper button in the Progress area of the main window is a dual function button. When no progess status information is displayed, the button label appearance is **Set Defaults**. Clicking this button resets most VLoad parameters to their initial default settings, as listed below.

- Unit List
  - Column order: IP Address, Type, Serial #, App Ver, Base Ver
  - Column widths: 100, 90, 90, 72, 90 pixels
  - Row order: ascending IP address
- For each unit
  - Transfer rate: 900 Kbps
  - Port number: c001 hex (hard-coded)
  - Attempts: 3 iterations
  - Timeout: 3 seconds
  - Reset type: hard
  - Application
    - Next image to run: unchecked (current modem setting)
    - Next image to save: unchecked (current modem setting)
    - Next image to get: unchecked (current modem setting)
    - Flash timeout: 90 seconds (hard-coded)
  - Base Modem
    - Next image to run: unchecked (current modem setting)
    - Next image to save: unchecked (current modem setting)
    - Flash timeout: 120 seconds (hard-coded)
  - Configuration
    - Get from: active
    - Put to: active only
    - Flash timeout: 30 seconds (hard-coded)
  - Unit Information
    - FAST code: none
    - Device type: none
    - Serial number: none
    - Name: none
    - Version: none
    - Network ID: none

- Codecast parameters
  - Time to live: 10 hops
  - Local address: any
  - Remote Multicast address: 239.1.2.4
  - Repetition: 3 iterations
  - Transfer rate: 900 Kbps
  - Pause: 5 seconds
  - Port number: c001 hex (hard-coded)
  - Application
    - Next image to run: unchecked (current modem setting)
    - Next image to save: unchecked (current modem setting)
  - Base Modem
    - Next image to boot: unchecked (current modem setting)
    - Next image to save: unchecked (current modem setting)
- Window placement: centered

NOTE

Note: To reset all VLoad parameters to their initial default settings, rename the VLoad.exe file. This establishes a new set of values in the Windows registry, including unit listing, file selection links, and window position on the desktop.

When progress status information is displayed following a VLoad action, the button label appearance is **Clear**. Click on the Clear button to clear the display in the Progress area.

View Log

Clicking the **View Log** button opens the event log file, displaying the activity taken by the VLoad Utility as shown in the example in figure 3-9.

Event log data provides a handy reference as to what action has been taken by VLoad with any Vipersat modem in the network, and the corresponding results. The information is contained in a simple text file named **Vload.log** that VLoad creates in the Windows directory *C:\Documents and Settings\<username>\Application Data\Vload*. This file can be opened independently of the VLoad program, providing an easy means for copying or saving the file and/or its contents in a variety of formats for offline use.

The event log contains a detailed history of sequenced events, and provides a useful tool for troubleshooting problems.

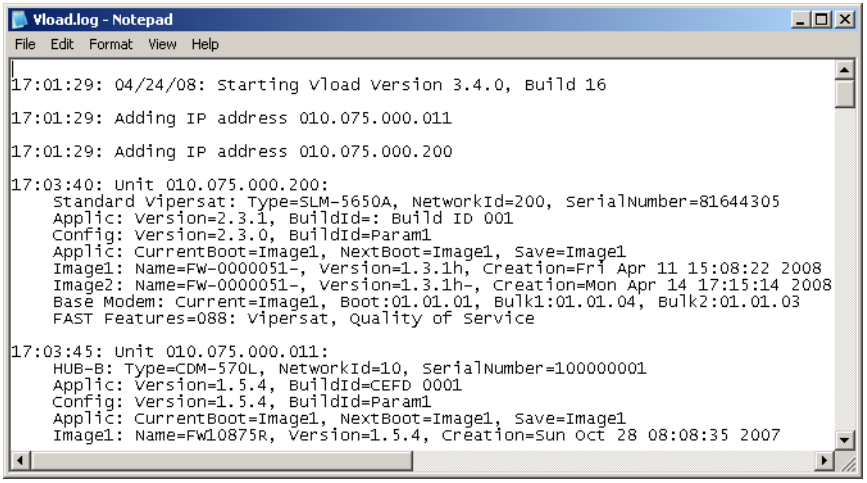

Figure 3-9 View Log window

NOTE

Note: Each time the VLoad application is opened, a new log file is created, overwriting the previous log file. To retain a previous log file, either rename it or relocate it to another directory prior to restarting VLoad.

Exit

Clicking on the **Exit** button terminates VLoad and closes the program.

Image Selection

The user should have a thorough understanding of the material presented in this section prior to performing image selection operations as described in the *Application Mode* (page 3-23) and *Base Modem Mode* (page 3-39) sections of this user guide.

Warning: This is an advanced feature to be used only by depot level setup and repair technicians and users who have been trained in the use of this procedure.

Using this feature requires a detailed understanding of the unit's architecture. Unless the user thoroughly understands this feature, its use can result in an unusable unit.

Note: In the following discussion, the following terms are synonymous: IP Option, IP Bulk, and Application. The word "unit" refers to the combination of the Base Modem and IP Option. The word "image" refers to the binary image of the software that controls the unit as well as its location in flash memory.

Saving Images to Units

Amongst its features, VLoad can save an image (Base Modem and/or IP Option) to flash memory and then reboot (Hard Reset) the system. This section describes how VLoad can be used to control the placement of these images in flash memory. Without VLoad, the image selection must be done via either the menu based CLI (Command Line Interface) or the Web Browser Interface and then the image downloaded via FTP. VLoad integrates these two functions. The images are labeled "Image 1" and "Image 2" based on where they are physically located in the unit's memory space.

Note: The Vipersat CDM-570/570L and SLM-5650A have separate and independent images for both the Base Modem and the Application (IP/Router Option). Since the Base Modem and Application have different release cycles, their images are not kept synchronized. In other words, the latest Base Modem might be in Image 1 while the latest Application might be in Image 2.

The image saving options are:

- Image 1
- Image 2
- Existing (Unchecked)

The system booting options are:

- Image 1
- Image 2

- Existing (Unchecked)

The default setting for these options in VLoad is Existing/Unchecked (current modem setting).

Image 1 and Image 2

Image 1 and Image 2 are self explanatory; the image is always saved to or booted from the selected image, independent of its status.

Existing Image (Unchecked)

Existing refers to the current setting of the unit without regard to how it was last set from the CLI, Web, or VLoad. For “Put Application” or “Put Base Modem”, this means that VLoad will send the image to the unit and the unit will determine which image to use based on the currently existing setting. Similarly for Hard Reset, VLoad will just send a reset command and the unit will use its existing setting to do the reboot. In other words, selecting “Existing” is essentially a “No Operation” in terms of selecting the affected image.

Finally, setting the image for Hard Reset is always persistent through reboots, but setting the image for Base Modem reboot or Put Application is only effective until the unit is rebooted unless the configuration is saved to flash before rebooting.

For example, if VLoad does a “Put Application” to Image 1 and the modem was configured to “Upgrade” to image 2, then the Application will be saved in Image 1. However, if the unit is then Hard Reset without first saving the configuration, then if the next time VLoad does a “Put Application” to existing, the application will be saved in Image 2.

Special Base Modem Considerations

When doing a hard reset, both the Base Modem and the IP Option are always booted. The process is controlled by the IP option which sets the image for the Base Modem and then issues a reset command to the Base Modem after which the IP Option resets itself. This is the only option that affects the image selection for both the Base Modem and the Application. Selecting either Image 1 or Image 2 for a Hard Reset will cause the appropriate Application to be booted along with the last selected image of the Base Modem. Likewise, selecting Hard Reset with the Existing image will cause the unit to determine which images to reboot for both the Base Modem and Application.

Starting VLoad

Locate the **VLoad.exe** file in the VLoad directory on the hard drive of the workstation and double-click to open it. The initial **VLoad** window will appear, as shown in figure 3-10.

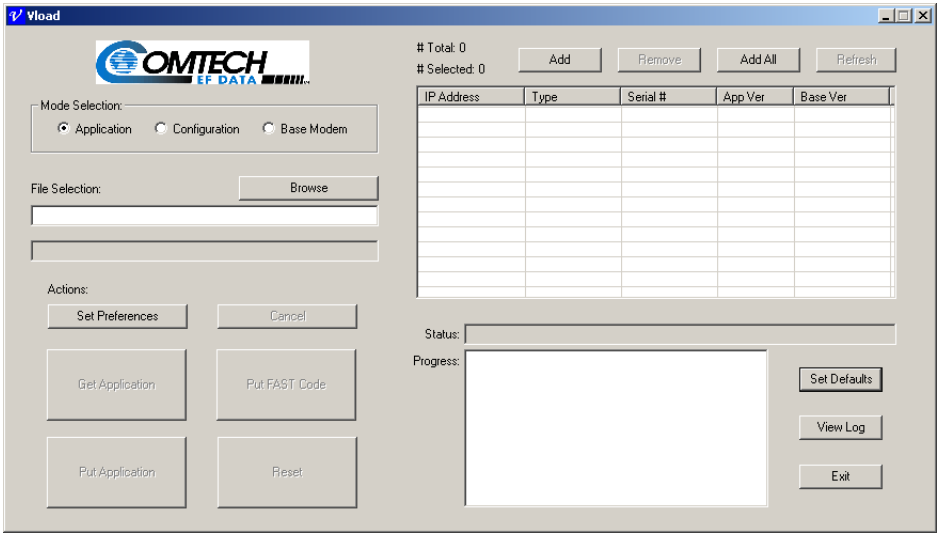

Figure 3-10 VLoad Utility, Initial Window

Once the VLoad utility has been started, the next step is to list the unit(s) from which information is to be retrieved, or that require action to be performed on them. This is described in the next section, “Unit Listing and Selection”.

Unit Listing and Selection

The listing and selection area of the main window, shown in Figure 3-11, lists the modem units which have been accessed by the VLoad utility. Typically, the first time that VLoad is started, no units will be displayed. Units must be added to the listing through the use of the **Add** and **Add All** buttons, which are described below.

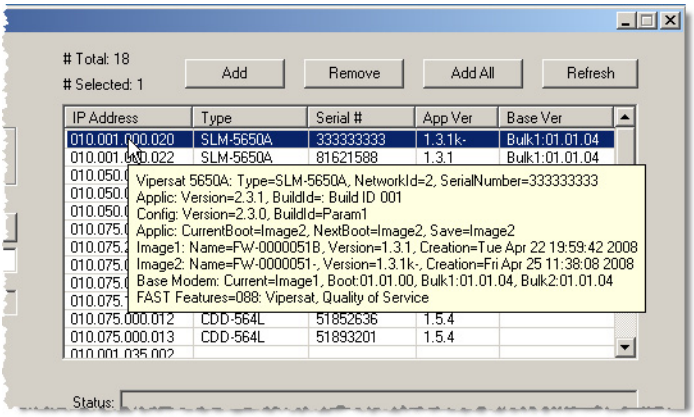

Figure 3-11 Unit Listing / Selection box, InfoTip displayed

Unit Information

The unit listing information that is displayed in the main VLoad window includes the IP Address, the modem Type, the Serial number, and the Application and Base Modem versions associated with each unit.

Note that in figure 3-11 there is an information pop-up shown that displays detailed information for the unit under the pointer. This information is only displayed momentarily (by Windows Explorer) when the mouse pointer rolls over the IP Address for a unit.

This same detailed information can be displayed by double-clicking on a unit listing to open the **Unit Information** window for that modem, as shown in figure 3-12.

Click the **Close** button to close the window.

Tip: Following a Refresh or Add All operation, the unit information can also be viewed in the VLoad event log, as shown in figure 3-9.

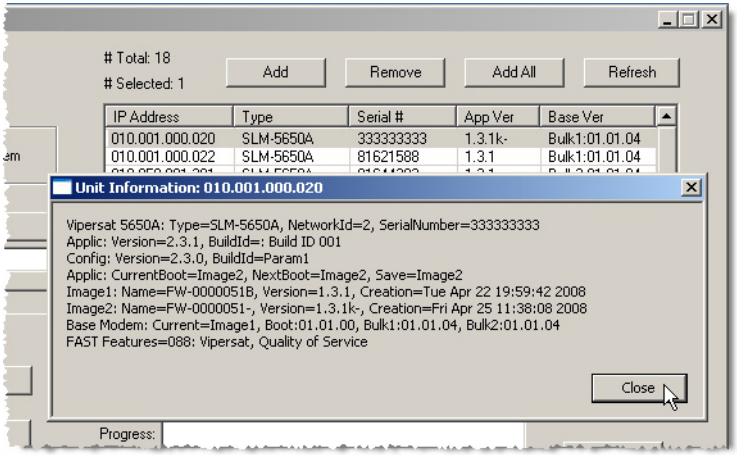

Figure 3-12 Unit Information window

Adding Units

A unit is added to the list by either:

- Clicking the **Add** button, or
- Clicking the **Add All** button

Add

Clicking the **Add** button allows adding a single Vipersat modem using the dialog shown in Figure 3-13.

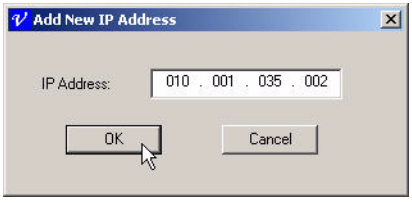

Figure 3-13 Add New IP Address dialog

NOTE

Note: The SLM-5650A has three IP addresses: the Base Modem address, the TRANSEC (transmission security) address, and the Router/NP (network processor) option card address. Only use the IP address of the NP card with VLoad.

Enter the IP address of the unit, then click the **OK** button to add that unit to the list. The IP address of the unit will appear in the list with all other fields blank, as shown in figure 3-14. There is no unit verification nor auto retrieval of unit information with the Add function.

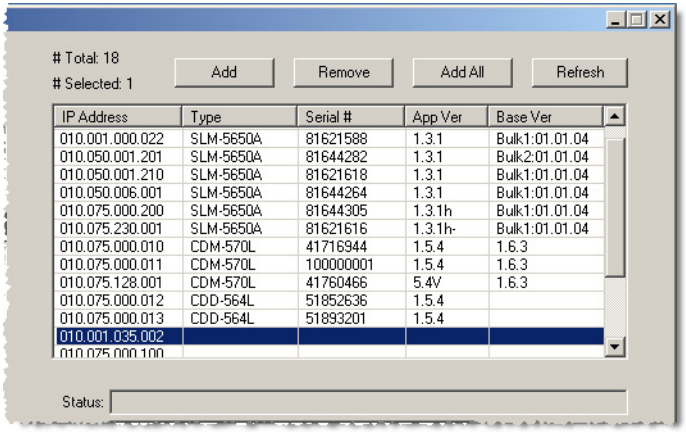

Figure 3-14 New IP Address Added

Whenever a unit is added using the Add button, VLoad only displays its IP address and leaves all the rest of the fields blank. To fill in the rest of the data, click the **Refresh** button to retrieve the data from any target unit(s) that are live on the network.

Add All

Clicking the **Add All** button allows adding multiple units to the list by specifying one or more Multicast Addresses for the Vipersat network, as shown in figure 3-15.

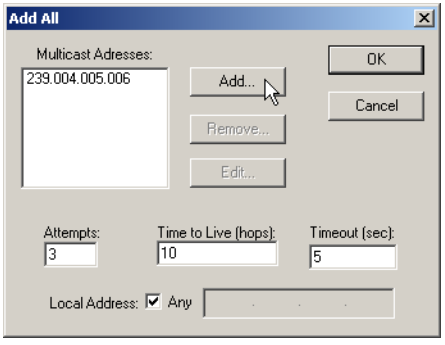

Figure 3-15 Add All dialog

This dialog window allows multicast addresses to be added, removed, and edited. Enter the Receive Multicast Address that is assigned to the units that are to be listed. By default, the address 239.004.005.006 always appears in the address listing, since this is the default Receive Multicast Address of all Vipersat units when they are shipped from the factory.

As is typical with multicast configurations, the attempts, timing, and addressing can be specified, as is required for the given network.

- **Attempts** – Enter the number of attempts for sending the multicast until receiving a reply from the units. When multiple multicast addresses are specified, this number of attempts will apply for each address before proceeding to the next address.
- **Timeout** – Enter the number of seconds to wait for responses to the multicast poll before going on to the next attempt.
- **Time to Live** – Enter the number of router hops/seconds allowed between the point of origin and the destination before the data packet expires. For example, a setting of 5 would prevent remote mesh unit responses from getting back to a host at the Hub. This parameter prevents possible looping of the packet transmission in the network.
- **Local Address** – Specify the address of the network interface card (NIC) on the local host machine to be used for the multicast. If necessary, the specific IP address can be entered; otherwise, the **Any** box should be checked. This parameter is provided to accomodate host machines that have multiple NICs.

Removing Units

Units can be removed from the listing area with the use of the **Remove** button. Select the unit(s) to be removed, then click on the Remove button. A dialog window will appear that requires the operation to be confirmed or cancelled.

Refresh

The unit information for listed modems can be updated by clicking the **Refresh** button at the top of the Listing/Selection area of the main window. This Refresh operation is performed on a selective basis. To update the information for a single unit, first select the unit to highlight its listing, then click Refresh. Multiple units can be selected and updated in a similar manner. If no units are selected, clicking the Refresh button will result in all listed units being updated.

Each listed unit is polled consecutively. The status of the polling and retrieval of information is displayed in the Progress area of the window, as shown in figure 3-16. Three attempts, each with a two second time-out, are made to retrieve the current status of the unit. If a VLoad Refresh action is unable to retrieve information from a target unit, that event (**Fail**) is displayed in the Status box, indicating that the IP address is either invalid or is not accessible on the network. Refer to the event log for more detailed information, such as which unit(s) failed the refresh attempt.

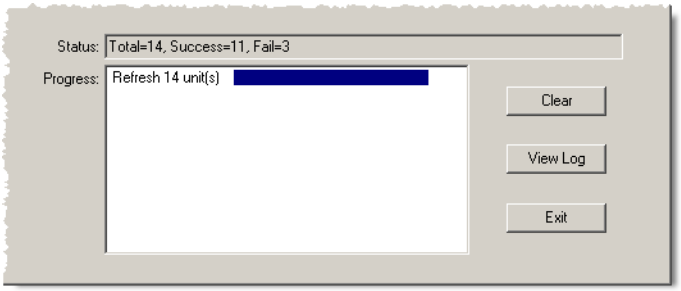

Figure 3-16 Progress Status, Unit Refresh

Order of the List

The order of the unit listing can be modified in several ways. Clicking on a column heading will toggle the list between ascending and descending order for that column. Subsequently clicking on another column heading will sub-order the list based on the first heading.

The five columns can also be re-arranged by click-hold and dragging a column heading to the right or to the left. Column widths are adjusted using standard table methods.

Once the desired modem units have been listed, the next step is to select the unit or units to be acted upon and choose the appropriate action for VLoad to perform. These actions are described in the following sections for *Application Mode*, *Configuration Mode*, and *Base Modem Mode*.

Application Mode

Selecting the **Application** radio button in the **Mode Selection** box, shown in figure 3-17, sets VLoad to act on the application firmware running on the router portion of the selected Vipersat modems.

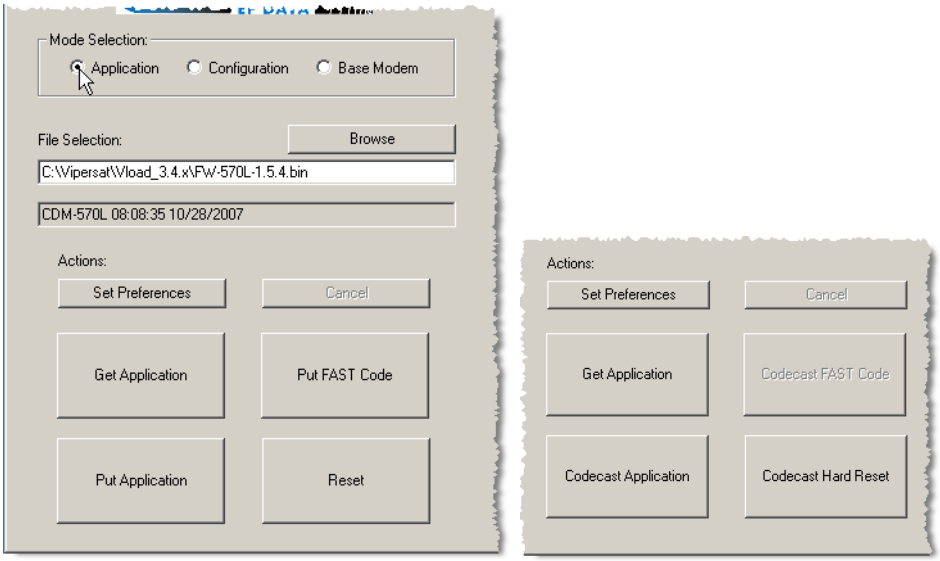

Figure 3-17 Application Mode Selection

This mode is used to **Get** and/or **Put** an application image from/to the unit(s), as well as to **Put** a **FAST** Feature **Code** to the unit.

NOTE

Note: Button captions displayed and functions available for all modes are controlled by the *Mode* selected from the **Mode Selection** radio buttons, the selected **Preference**, as well as the *Type* of modem unit that is selected from the **Unit List**.

File Selection

When performing a Put action, the Application .bin file must first be selected. By default, VLoad will automatically select the previous Application .bin file that was last Put to—or retrieved from (Get)—a modem. Use the **Browse** button to locate another file, or a file that is stored in another directory, as shown in figure 3-18. Alternatively, the path for the desired file can be entered directly using the keyboard.

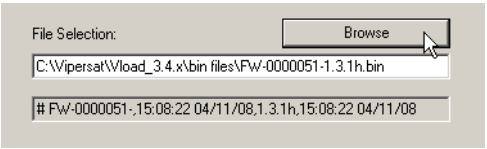

Figure 3-18 Application File Selection

To acquire a current release image for updating the Application (IP) portion of a modem, the image file can be downloaded from the Comtech EF Data website, as shown in figure 3-19.

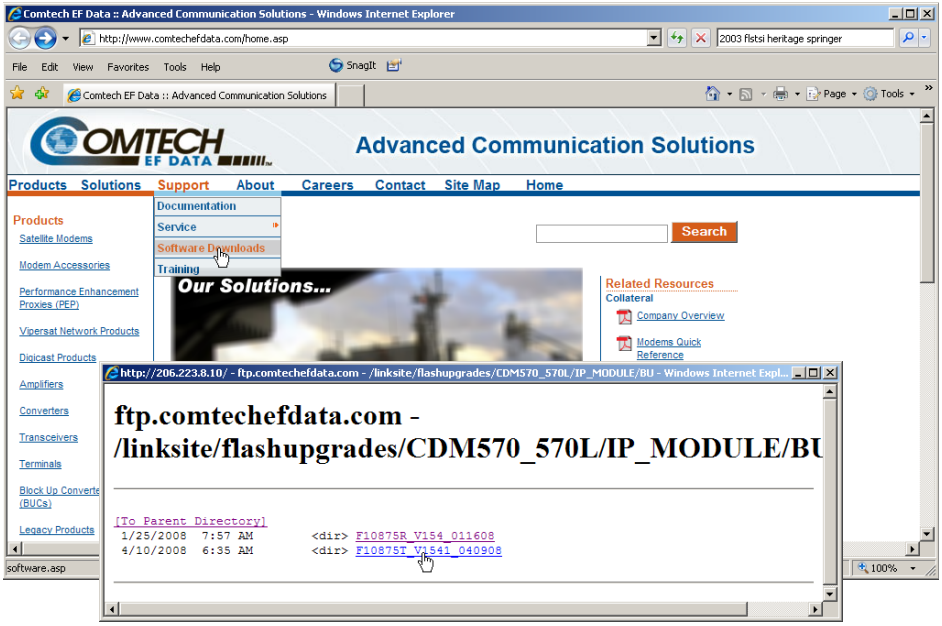

Figure 3-19 Acquiring Application Image from Website

Once the flash upgrade file has been downloaded, use the **File Selection Browse** button to locate and select the image file to be uploaded to the target modem(s).

Actions

When the Application radio button in the Mode Selection box is chosen and a device (or devices) in the **Unit Listing** area is selected, the buttons in the **Actions** area are activated with the following labels:

- **Get Application** – This action retrieves a copy of the router application image from the modem and saves it, either for back-up purposes or to Put it to another modem. The Get Application button is activated if a single unit is selected, and deactivated (grayed out) when multiple units are selected.
- **Put Application** – This action replaces the router application image in the designated *Save To* slot for the modem with the chosen .bin file. When using the *Codecast* preference, this action button is labeled either **Codecast Application** (when units are selected) or **Codecast Application to ALL Units** (when no units are selected).

  This button is activated if the file displayed in the **File Selection** frame is a valid application file, confirmed by the display of the Vipersat modem's model and the file's creation time and date in the lower read-only display in the File Selection area.

  If a valid file is not currently selected, this button will be grayed out. Either browse to locate a valid file, or first perform a Get Application operation on a modem unit that has the appropriate file.

NOTE

Note: For new modem types that have not yet been predefined in VLoad, file validation can be inhibited by setting the Preferences to Unrestricted. Using this preference in Application Mode will allow any application file to be Put to any modem type. See the "Unrestricted" section on page 3-7 for more information.

- **Put FAST Code** – This action allows the operator to add a new FAST (Fully Accessible System Topology) Code to the selected unit(s). The Put FAST Code button is always enabled unless no unit selection has been made.

Get Application

Clicking the **Get Application** button displays the **Get Application From Unit** dialog window shown in figure 3-20.

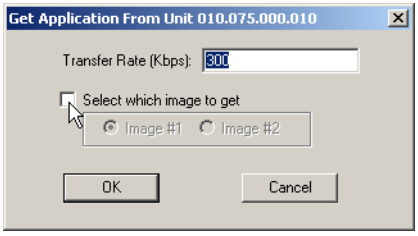

Figure 3-20 Get Application dialog

The Get Application function is only operable for one unit at a time, so only one modem can be selected from the unit list.

In the default window shown in figure 3-20, only the **Transfer Rate (Kbps)** dialog box is editable. Select a transfer rate between 1 and 9980 Kbps which will transfer data error-free, or use the default value of 900 Kbps.

Clicking the **Select Which Image to Get** check box enables the selection of the Image file to retrieve, as shown in figure 3-21. If this box is not checked, then the Image will default to Existing and be determined from the current modem setting.

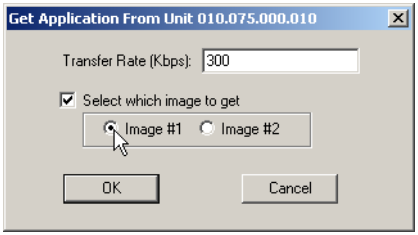

Figure 3-21 Get Application dialog, Advanced

In the **Image** box, use the radio buttons to select which image from the target unit is to be retrieved. The options are:

- **Image #1** – The first image stored in the unit's flash memory.
- **Image #2** – The second image stored in the unit's flash memory.

Refer to the "Image Selection" section on page 3-15 for detailed information on these different image types and how they are used in the modem.

Tip: A Vipersat modem's active and flash memories do not necessarily contain the same version of the unit's operating software. Make certain that the source (active or flash memory) of the Get command contains the desired version to be downloaded by the VLoad utility. To determine which version is contained in each image, open the **Unit Information** window for that unit (refer to the "Unit Information" section on page 3-18).

Clicking the **OK** button sets the values to be used and initiates the Get action. The Progress area of the main window will display the transfer progress status shown in figure 3-22. The Blue progress bar indicates that a transfer is in process.

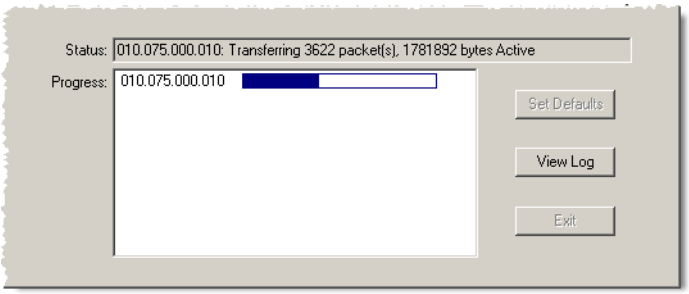

Figure 3-22 Get Application Progress Status

When the transfer is successful, VLoad invokes a **Save As** file dialog, allowing a name and path to be chosen for storing the .bin file. If saved, the appearance of the progress bar will change to Green to indicate that the operation was successful. If the file is not saved, the progress bar will change to Orange and the staus text will state that the operation was completed, but the file was not saved.

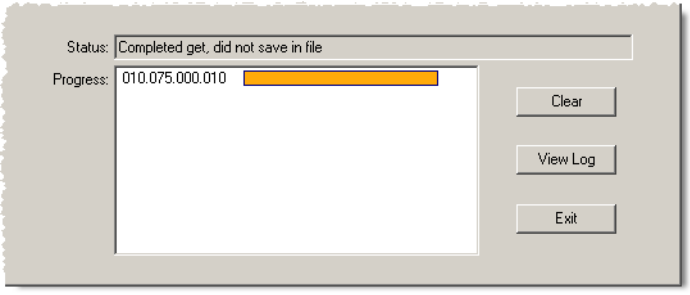

Figure 3-23 Get Completed, File Not Saved

Put Application / Codecast Application

Clicking the **Put Application / Codecast Application** button displays the dialog window shown in figure 3-24.

NOTE

Note: The files put by the Put Application command are only put to the modem's Vipersat router board. Refer to the "Base Modem Mode" section on page 3-39 for putting files to the base modem portion of the modem.

This function is operable for either a single unit or multiple units. If multiple units are selected for a Put Application, the **Same For All Selected Units** check box will appear, providing the option to perform the Put to the group using the same specified settings.

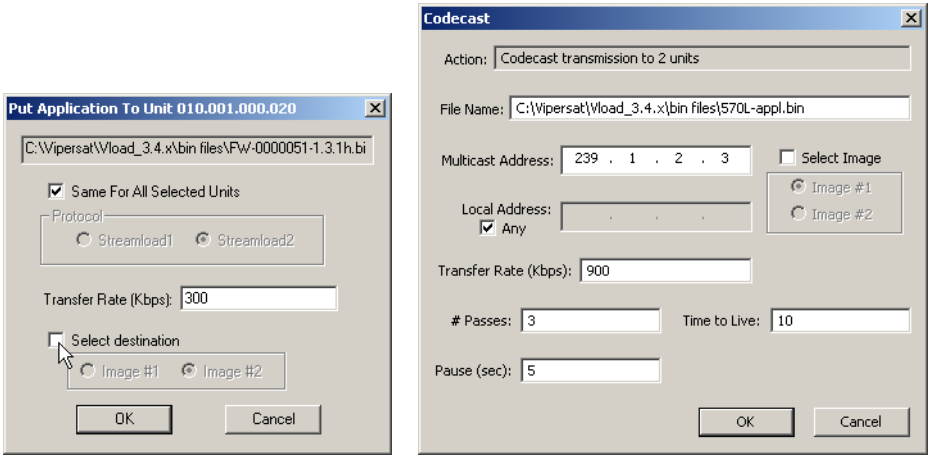

Figure 3-24 Put Application / Codecast Application dialog

For a *Put Application*, the **File** box at the top of the window is read-only and shows the path and file name (designated in the File Selection box in the main window) of the binary file to be Put to the target Vipersat modem.

For a *Codecast Application*, the file path and name can be edited, if desired.

The **Multicast Address** specified determines the modem group to be targeted. By default, the address 239.1.2.4 appears since this is the default Codecast Multicast Address of Vipersat units when they are shipped from the factory.

Because Codecast utilizes multicast with no verification, the Codecast Application dialog displays the following IP multicast parameter settings:

- **# Passes** – the number of transmissions to each unit (default is 3).
- **Pause** – the time, in seconds, between transmissions (default is 5 sec).
- **Time to Live** – the maximum number of router hops/seconds to reach a unit before the data packet expires (default is 10). This parameter prevents possible looping of the packet transmission in the network.
- **Local Address** – the address of the network interface card (NIC) on the local host machine to be used for the multicast. If necessary, the specific IP address can be entered; otherwise, the **Any** box should be checked. This parameter is provided to accomodate host machines that have multiple NICs.

These settings are editable; however, the default values are typically adequate for most networks.

Select a **Transfer Rate** between 1 and 9980 Kbps which will transfer data error-free, or use the default value of 900 Kbps.

Clicking the **Select Destination/Image** check box enables the selection of the Image to which the file will be copied, as shown in figure 3-25.

NOTE

Note: The Select Destination option is not available for SLM-5650A modems; for these units, the new image is always Put to the *inactive* image.

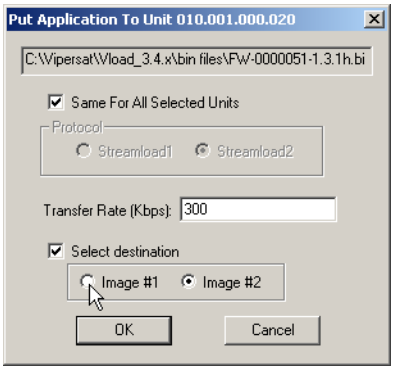

Figure 3-25 Put Application dialog, Image Selection

If this box is not checked, then the Image will default to Existing and be determined from the current modem setting. Note that the Unit Information window can be opened to view the firmware version for each of the images, as well as the *Current*, *Boot*, and *Save* Image designations.

The Put options available in the **Image** box of the Put dialog allow the *Save To* image slot of the modem to be designated for replacement of the application .bin file:

- **Image #1** – The application file will be written to the target unit's slot with the label of Image #1.
- **Image #2** – The application file will be written to the target unit's slot with the label of Image #2.

The Put operation transfers the selected application file to the designated Save To image slot by writing it to the target unit's flash memory. This is non-volatile memory used by the modem's Vipersat IP router board to persistently store its application programs. These stored images are not currently running on the unit, but can be selected from flash memory by command as required. Refer to the "Image Selection" section on page 3-15 for additional information.

Clicking the **OK** button sets the values to be used and initiates the Put action. The Progress area of the main window will display the transfer progress status.

The Put Application is a two-step process:

1) The file is transferred to the unit.

2) The data is written to flash memory.

This process can take up to several minutes, depending on the data transfer rate as well as the type and the number of units selected. For example, the Put Application process to a single SLM-5650A modem at a transfer rate of 1,000 Kbps will take approximately 2.5 minutes to transfer the file and another 6 minutes to write the data to flash.

Following a successful Put operation, executing a **Hard Reset** will command the modem to reboot and load the new image.

Put FAST Code

Clicking the **Put FAST Code** button displays the **Put FAST Code To Unit** dialog window shown in figure 3-26. This function allows a feature enhancement upgrade for the selected modem unit(s) to be implemented through the use of a unique access code that is purchased from Comtech EF Data.

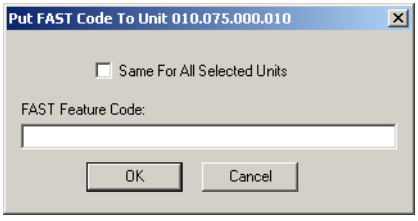

Figure 3-26 Put FAST Code dialog

The Put FAST Code function is operable for either a single unit or multiple units. If multiple units are selected, the **Same For All Selected Units** check box will appear, providing the option to upgrade the group with this same feature. Note, however, that since each unit requires a unique code, Putting to multiple units will result in the appearance of a FAST Code prompt dialog for each unit.

Enter the 20-character hexidecimal access code in the **FAST Feature Code** box.

Click on the **OK** button to Put the FAST Code to the unit(s). The Progress area of the main window will display the transfer progress status.

Following a successful Put operation, executing a **Hard Reset** will command the modem to reboot and load the new feature codes.

All Application Mode actions are recorded in the event log. Clicking the **View Log** button opens the log file, as shown in figure 3-27.

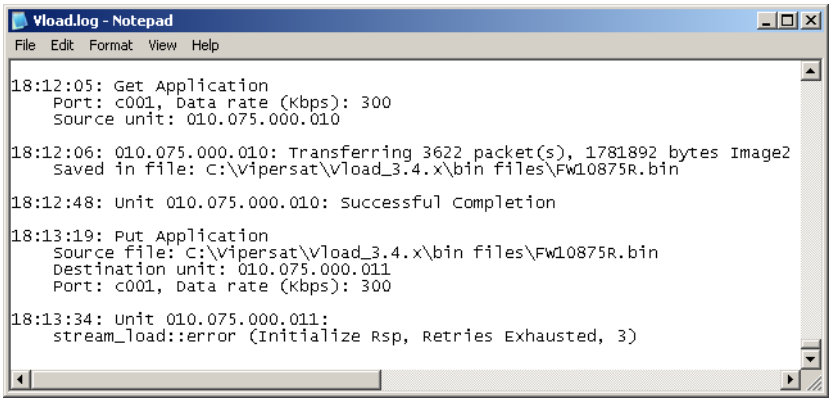

Figure 3-27 Event Log display for Get and Put Application

Configuration Mode

Selecting the **Configuration** radio button in the **Mode Selection** box, as shown in figure 3-28, sets VLoad to act on the configuration parameter file that is loaded into the selected Vipersat modems.

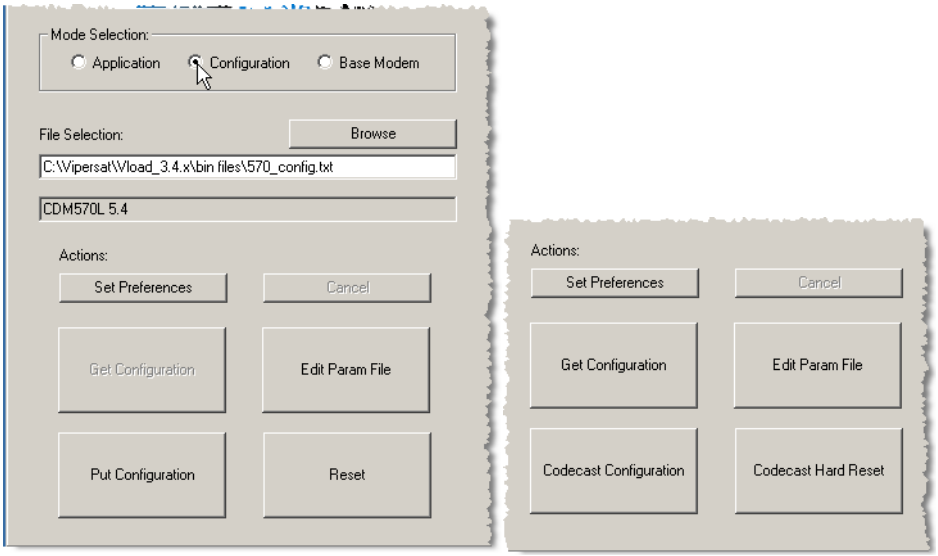

Figure 3-28 Configuration Mode Selection

This mode is used to **Get** and/or **Put** a configuration file from/to the unit(s), as well as to **Edit** the parameter file for a unit.

NOTE

Note: Button captions displayed and functions available for all modes are controlled by the *Mode* selected from the **Mode Selection** radio buttons, the selected **Preference**, as well as the *Type* of modem unit that is selected from the **Unit List**.

File Selection

When performing a Put action, the Configuration file must first be selected. This file can be one of two types:

- **Text Configuration File** – This file type is the standard *.txt* parameter file type used by the Parameter Editor, the software utility that is used for making configuration changes (see the “Edit Param File” section on page 3-38).

- **Vipersat File** – This file type (*.vipersat-modem-config*) is VMS compatible and is used when importing/exporting configuration files to/from the VMS. This allows a configuration that has been exported from the VMS to be selected and Put to a modem using VLoad.

  Note that, when a Vipersat File is selected for a Put operation, VLoad automatically creates a Text Confuguration File version of that same configuration and places it in the original file's directory. This is done to enable configuration changes with the VLoad Edit Param File button without having to first perform a Get operation and save the data as a .txt file.

By default, VLoad will automatically select the previous Configuration file that was last Put to–or retrieved from (Get)–a modem. Use the **Browse** button to locate another file, as shown in figure 3-29. Alternatively, the file path may be entered directly in the File Selection field.

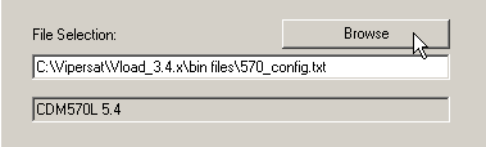

Figure 3-29 Configuration Parameter File Selection

Actions

When the Configuration radio button in the Mode Selection box is chosen and a device (or devices) in the **Unit Listing** area is selected, the buttons in the **Actions** area are activated with the following labels:

- **Get Configuration** – This action retrieves a copy of the configuration parameter file from the modem and saves it, either for back-up purposes or to Put it to another modem. The Get Application button is activated if a single unit is selected, and deactivated (grayed out) when multiple units are selected.
- **Put Configuration** – This action replaces the existing configuration parameter file for the modem with the chosen file. When using the *Codecast* preference, this action button is labeled either **Codecast Configuration** (when units are selected) or **Codecast Configuration to ALL Units** (when no units are selected).

  This button is activated if the file displayed in the **File Selection** frame is a valid configuration file, confirmed by the display of the Vipersat modem's model and the file's creation time and date in the lower read-only display in the File Selection area.

If a valid file is not currently selected, this button will be grayed out. Either browse to locate a valid file, or first perform a Get Configuration operation on a modem unit that has the appropriate file.

NOTE

Note: For new modem types that have not yet been predefined in VLoad, file validation can be inhibited by setting the Preferences to Unrestricted. Using this preference in Configuration Mode will allow any param file to be Put to any modem type. See the "Unrestricted" section on page 3-7 for more information.

- **Edit Param File** – This action opens the Parameter Editor window for making configuration changes to the param file that can then be Put to a modem. The Edit Param File button is enabled whenever the File Selection is valid and a ParamEdit.dll file for that version of parameter file exists in the VLoad directory; no unit selection is required since this function operates on a file that is in the network directory.

Get Configuration

Clicking the **Get Configuration** button displays the **Get Configuration From Unit** dialog window shown in figure 3-30.

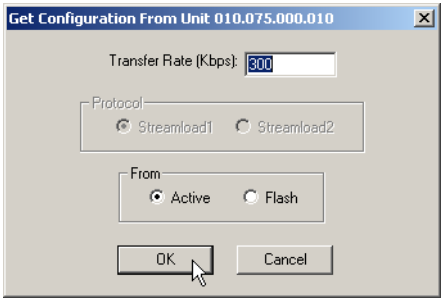

Figure 3-30 Get Configuration dialog

The Get Configuration function is only operable for one unit at a time, so only one modem can be selected from the unit list.

Specify a **Transfer Rate (Kbps)** between 1 and 9980 Kbps which will transfer the data error-free, or use the default value of 900 Kbps.

Select either **Active** or **Flash** as the **From** radio button, depending on whether the configuration will be retrieved from the Active memory or the Flash memory of the unit.

Clicking the **OK** button sets the values to be used and initiates the Get action. The Progress area of the main window will display the transfer progress status

shown in figure 3-31. The Blue progress bar indicates that a transfer is in process.

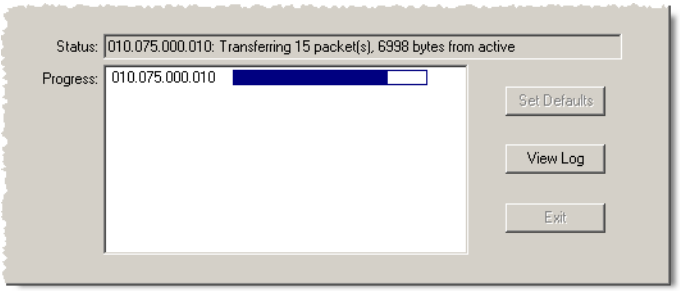

Figure 3-31 Get Configuration Progress Status

When the transfer is successful, VLoad invokes a **Save As** file dialog, allowing a name, file type, and path to be chosen for storing the configuration file to the designated directory. The file name, if not specified, defaults to the last previously named file. The file type defaults to a Text Configuration File (*.txt*) type, but a Vipersat File (*.vipersat-modem-config*) type can be chosen from the pull-down menu, as shown in figure 3-32.

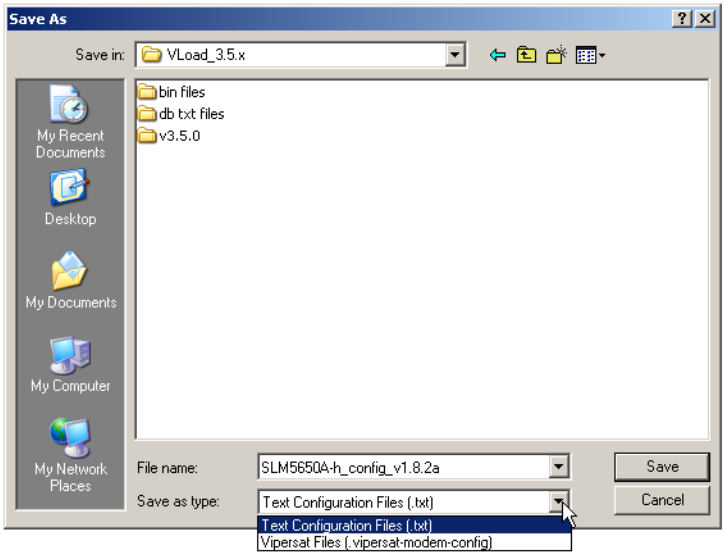

Figure 3-32 Save As dialog, Configuration File

Note that, when the Vipersat File type is chosen, a Text Configuration File is also created automatically.

If saved, the appearance of the progress bar will change to Green to indicate that the operation was successful, as shown in figure 3-33, below. If the file is not saved, the progress bar will change to Orange and the Status text will state that the operation was completed, but the file was not saved.

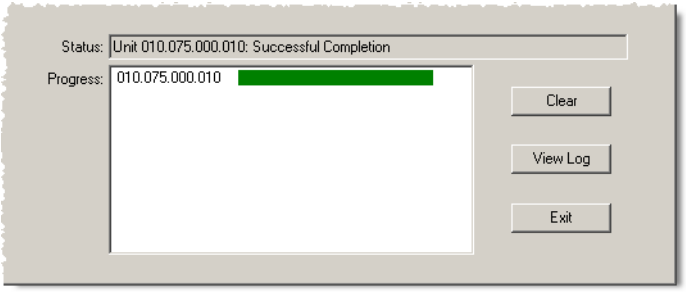

Figure 3-33 Successful Get Configuration Status

Put Configuration / Codecast Configuration

Clicking the **Put Configuration / Codecast Configuration** button displays the dialog window shown in figure 3-34.

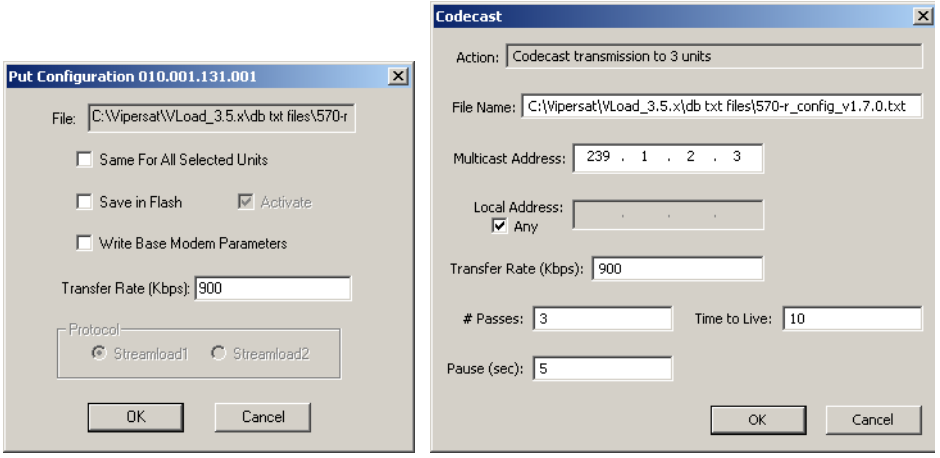

Figure 3-34 Put Configuration / Codecast Configuration dialog

This function is operable for either a single unit or multiple units. If multiple units are selected for a Put Configuration, the **Same For All Selected Units** check box will appear, providing the option to perform the Put to the group using the same specified settings.

NOTE

Note: When Putting a configuration to multiple units, all of the selected units will receive the same IP Address setting that is specified in the config file. This will result in the loss of communications with all but one of these units. Therefore, this method is only practicable, for example, when initially configuring units at a service depot prior to deploying them in an actual network.

The option to save the new configuration parameter file to the unit's flash memory can be chosen by clicking the **Save in Flash** check box. This option is not available for Codecast.

For the SLM-5650A modem, the option to make this new configuration active can be chosen by clicking the **Activate** check box. This is selectable for the SLM-5650A only; for the CDM-570/570L modem, the new configuration is always made active, and this option will appear grayed out.

NOTE

Note: When Save in Flash is chosen, it is recommended that a new configuration Put to a modem always be made active. This allows any performance problems caused by the new configuration to be discovered sooner rather than later (i.e., a future modem reset).

For a *Put Configuration*, the **File** box at the top of the window is read-only and shows the path and file name (designated in the File Selection box of the main window) of the parameter file to be Put to the target modem.

For a *Codecast Configuration*, the file path and name can be edited, if desired.

The **Multicast Address** specified determines the modem group to be targeted. By default, the address 239.1.2.4 appears since this is the default Codecast Multicast Address of Vipersat units when they are shipped from the factory.

Because Codecast utilizes multicast with no verification, the Codecast Configuration dialog displays the following IP multicast parameter settings. These settings are editable; however, the default values are typically adequate for most networks.

- **# Passes** – the number of transmissions to each unit (default is 3).
- **Pause** – the time, in seconds, between transmissions (default is 5 sec).
- **Time to Live** – the maximum number of router hops/seconds to reach a unit before the data packet expires (default is 10). This parameter prevents possible looping of the packet transmission in the network.
- **Local Address** – the address of the network interface card (NIC) on the local host machine to be used for the multicast. If necessary, the specific IP address can be entered; otherwise, the **Any** box should be checked. This parameter is provided to accomodate host machines that have multiple NICs.

For CDM-570/L and CDD-56X units that are *inactive* (e.g., redundancy standby) and currently have unknown/uncertain base modem configuration

settings, select the **Write Base Modem Parameters** option. This will push the parameter set of the selected file from the NP card to the base modem. This option is not available for the SLM-5650A and will appear grayed out.

Select a **Transfer Rate** between 1 and 9980 Kbps which will transfer data error-free, or use the default value of 900 Kbps.

Click on the **OK** button to Put the configuration to the unit(s). The Progress area of the main window will display the transfer progress status.

Following a successful Put operation, the new parameter set can be activated immediately by performing a Firm or Hard Reset (the *Activate* check box must be selected, as shown in figure 3-34).

Edit Param File

Clicking the **Edit Param File** button opens the **Parameter Editor** window, as shown in figure 3-35. A configuration file must be selected first by use of the File Selection/Browse feature. The file can be either a Text Configuration File type (*.txt*) or a Vipersat File type (*.vipersat-modem-configuration*).

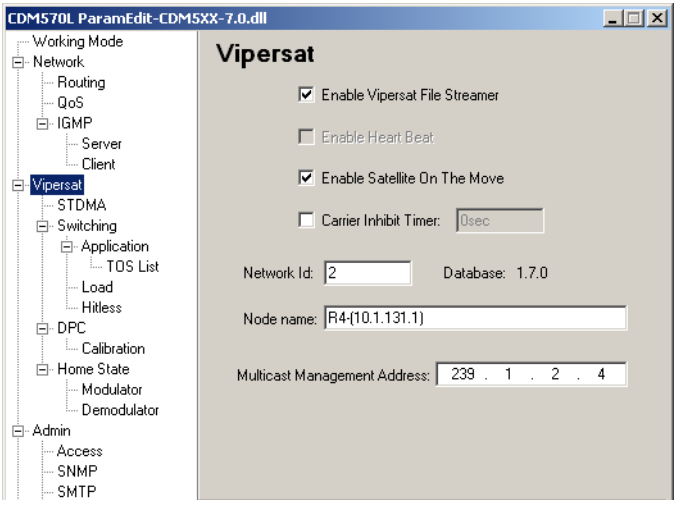

Figure 3-35 Parameter Editor window

The Parameter Editor is used for making configuration changes to the param file prior to performing a Put operation to the selected modem(s). Refer to the *Vipersat Parameter Editor User Guide* for detailed information on this function.

Any changes made to the param file will invoke a **Save As** file dialog, allowing a name, file type, and path to be chosen for storing the new file.

All Configuration Mode actions are recorded in the event log.

Base Modem Mode

Selecting the **Base Modem** radio button in the **Mode Selection** box, shown in figure 3-36, sets VLoad to act on the base modem firmware running on the unit.

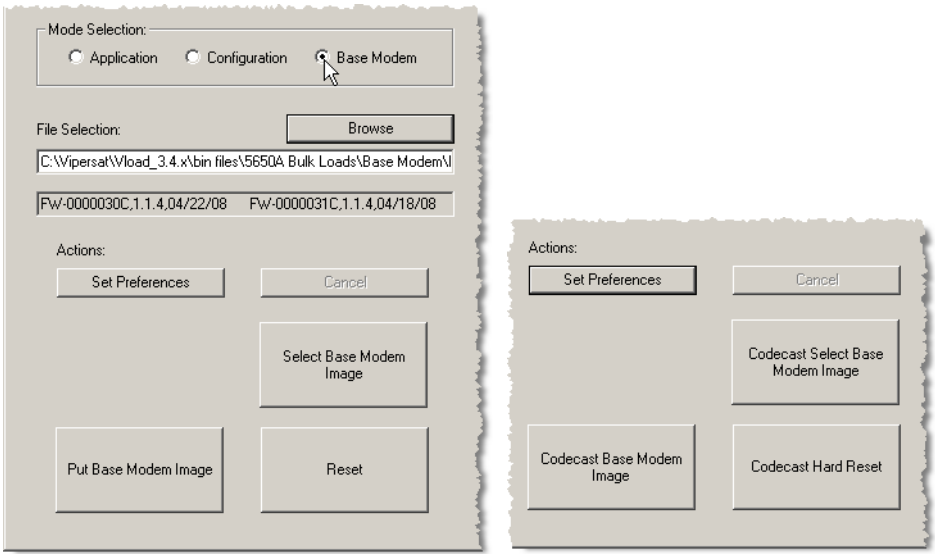

Figure 3-36 Base Modem Mode Selection

This mode is used to **Put** and/or **Select** the base modem image to/for the unit(s). Note that the **Get** capability is not available in this mode.

NOTE

Note: Button captions displayed and functions available for all modes are controlled by the *Mode* selected from the **Mode Selection** radio buttons, the selected **Preference**, as well as the *Type* of modem unit that is selected from the **Unit List**.

File Selection

When performing a Put action, the base modem .bin file must first be selected. By default, VLoad will automatically select the previous base modem .bin file that was last Put to a modem. Use the File Selection **Browse** button to locate another file, or a file that is stored in another directory. Alternatively, the path for the desired file can be entered directly using the keyboard.

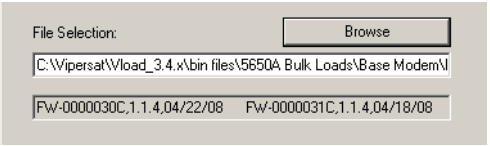

Figure 3-37 File Selection Browse Button

To aquire a current release image for updating the base modem portion of a modem, the image file can be downloaded from the Comtech EF Data website, as shown in figure 3-38.

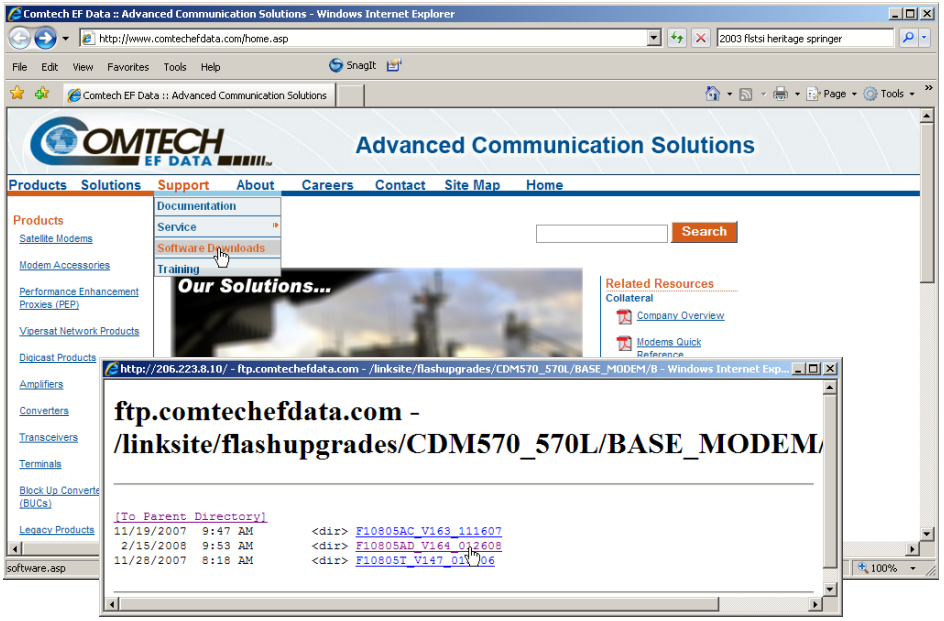

Figure 3-38 Acquiring Base Modem Image from Website

Once the flash upgrade file has been downloaded, use the **File Selection Browse** button to locate and select the image file to be uploaded to the target modem(s).

Actions

When the Base Modem radio button in the Mode Selection box is chosen and a device (or devices) in the **Unit Listing** area is selected, the buttons in the **Actions** area are activated with the following labels:

- **Put Base Modem Image** – This action replaces the base modem image in the designated *Save To* slot for the modem with the chosen .bin file. When using the Codecast preference, this action button is labeled either **Codecast Base Modem Image** (when units are selected) or **Codecast Base Modem Image to ALL Units** (when no units are selected).

  This button is activated if the file displayed in the **File Selection** frame is a valid image file, confirmed by the display of the Vipersat modem's model and the file's creation time and date in the lower read-only display in the File Selection area. If a valid file is not currently selected, this button will be grayed out. Browse to locate the appropriate file.

NOTE **Note:** For new modem types that have not yet been predefined in VLoad, file validation can be inhibited by setting the Preferences to Unrestricted. Using this preference in Base Modem Mode will allow any base modem .bin file to be Put to any modem type. See the "Unrestricted" section on page 3-7 for more information.

- **Select Base Modem Image** – This action designates from which base modem image the unit will boot and run. When using the Codecast preference, this action button is labeled **Codecast Select Base Modem Image**.

Put Base Modem Image / Codecast Base Modem Image

Clicking the **Put Base Modem Image** / **Codecast Base Modem Image** button displays the dialog window shown in figure 3-39.

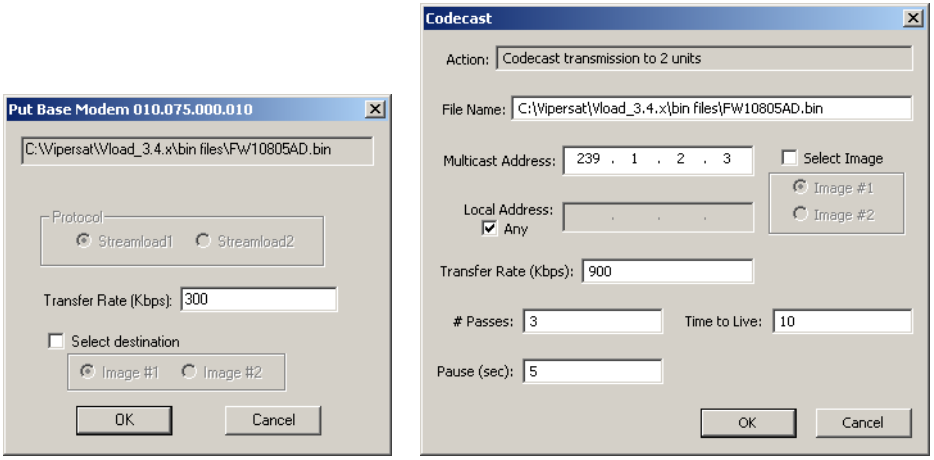

Figure 3-39 Put Base Modem Image / Codecast Base Modem Image dialog

NOTE **Note:** The files put by the Put Base Modem Image command are only put to the unit's base modem board. Refer to the "Application Mode" section on

page 3-23 for putting files to the Vipersat router board portion of the modem.

This function is operable for either a single unit or multiple units. If multiple units are selected for a Put Base Modem Image, the **Same For All Selected Units** check box will appear, providing the option to perform the Put to the group using the same specified settings.

For a *Put Base Modem Image*, the **File** box at the top of the window is read-only and shows the path and file name (designated in the File Selection box of the main window) of the binary file to be Put to the target Vipersat modem.

For a *Codecast Base Modem Image*, the file path and name can be edited, if desired.

The **Multicast Address** specified determines the modem group to be targeted. By default, the address 239.1.2.4 appears since this is the default Codecast Multicast Address of Vipersat units when they are shipped from the factory.

Because Codecast utilizes multicast with no verification, the Codecast Base Modem Image dialog displays the following IP multicast parameter settings:

- **# Passes** – the number of transmissions to each unit (default is 3).
- **Pause** – the time, in seconds, between transmissions (default is 5 sec).
- **Time to Live** – the maximum number of router hops/seconds to reach a unit before the data packet expires (default is 10). This parameter prevents possible looping of the packet transmission in the network.
- **Local Address** – the address of the network interface card (NIC) on the local host machine to be used for the multicast. If necessary, the specific IP address can be entered; otherwise, the **Any** box should be checked. This parameter is provided to accomodate host machines that have multiple NICs.

These settings are editable; however, the default values are typically adequate for most networks.

Select a **Transfer Rate** between 1 and 9980 Kbps which will transfer data error-free, or use the default value of 900 Kbps.

Clicking the **Select Destination/Image** check box enables the selection of the Image to which the file will be copied.

Note: The Select Destination option is not available for SLM-5650A modems; for these units, the new image is always Put to the *inactive* image.

If this box is not checked, then the Image will default to existing and be determined from the Current modem setting. Note that the Unit Information window can be opened to view the firmware version for each of the images, as well as the *Current*, *Boot*, and *Save* Image designations.

The Put options available in the **Image** box of the Put dialog allow the *Save To* image slot of the modem to be designated for replacement of the application .bin file:

- **Image #1** – The image file will be written to the target unit's slot with the label of Image #1.
- **Image #2** – The image file will be written to the target unit's slot with the label of Image #2.

The Put operation transfers the selected image file to the designated Save To image slot by writing it to the target unit's flash memory. This is non-volatile memory used by the modem's Base Modem board to persistently store its firmware. These stored images are not currently running on the unit, but can be selected from flash memory by command as required. Refer to the "Image Selection" section on page 3-15 for additional information.

Clicking the **OK** button sets the values to be used and initiates the Put action. The Progress area of the main window will display the transfer progress status.

The Put Base Modem Image is a three-step process:

1) The file is transferred from the workstation to the unit's router card RAM.
2) The router then transfers the file to the Base Modem.
3) The data is written to flash memory on the Base Modem board.

Note that this complete process may require up to several minutes, depending on the data transfer rate as well as the type and the number of units selected.

Following a successful Put operation, executing a **Hard Reset** will command the modem to reboot and load the new image.

Select Base Modem Image / Codecast Select Base Modem Image

Clicking the **Select Base Modem Image** / **Codecast Select Base Modem Image** button displays the dialog window shown in figure 3-40, allowing the selection of what image to run in the target modem on the next Reset.

This function is operable for either a single unit or multiple units. If multiple units are selected for a Select Base Modem Image, the **Same For All Selected Units** check box will appear, providing the option to perform this action on the group using the same specified settings.

For a *Codecast Select Base Modem Image*, the **Multicast Address** specified determines the modem group to be targeted. By default, the address 239.1.2.4 appears since this is the default Codecast Multicast Address of Vipersat units when they are shipped from the factory.

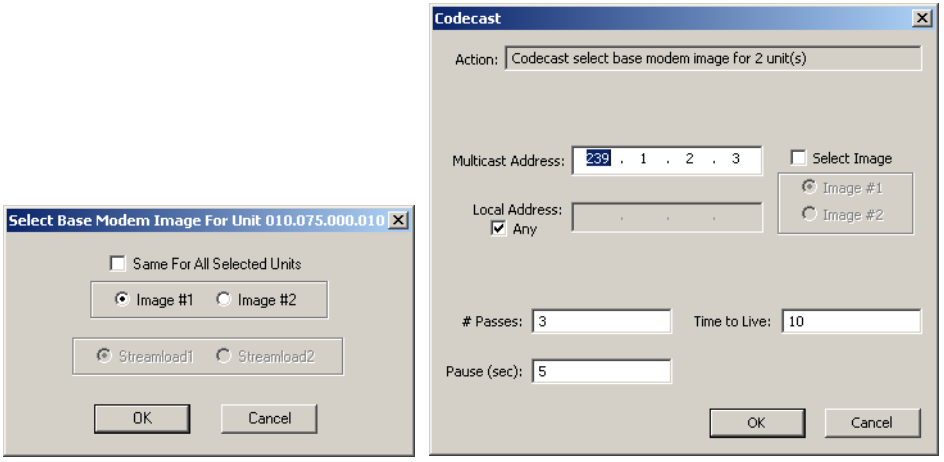

Figure 3-40 Select Base Modem Image / Codecast Select Base Modem Image dialog

Because Codecast utilizes multicast with no verification, the Codecast Select Base Modem Image dialog displays the following IP multicast parameter settings:

- **# Passes** – the number of transmissions to each unit (default is 3).
- **Pause** – the time, in seconds, between transmissions (default is 5 sec).
- **Time to Live** – the maximum number of router hops/seconds to reach a unit before the data packet expires (default is 10). This parameter prevents possible looping of the packet transmission in the network.
- **Local Address** – the address of the network interface card (NIC) on the local host machine to be used for the multicast. If necessary, the specific IP address can be entered; otherwise, the **Any** box should be checked. This parameter is provided to accomodate host machines that have multiple NICs.

These settings are editable; however, the default values are typically adequate for most networks.

The default **Base Modem Image To Run** can be designated by clicking on the desired Image radio button:

- **Image #1** – The base modem will run from the image in the target unit's slot with the label of Image #1.
- **Image #2** – The base modem will run from the image in the target unit's slot with the label of Image #2.

Note that the Unit Information window can be opened to view the firmware version for each of the images.

Refer to the "Image Selection" section on page 3-15 for additional information.

Clicking the **OK** button performs the image selection action. The Progress area of the main window will display the transfer progress status.

Perform a **Refresh** on the unit and verify the new image selection.

All Base Modem Mode actions are recorded in the event log.

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CHAPTER

4

USING VLOAD — DIGICAST MODE

This chapter describes the controls and capabilities that are available in VLoad when used with a *Digicast* network. For *Vipersat* networks, refer to Chapter 3, "Using VLoad — Vipersat Mode".

Starting VLoad

Locate the **VLoad.exe** file in the VLoad directory on the hard drive of the workstation and double-click to open it. When opening VLoad for the first time following installation, the initial **VLoad** window will appear, as shown in figure 4-1.

Note: Once the Preference is set to **Digicast**, subsequent openings of VLoad will display the Digicast main window, and it will not be necessary to select the Digicast mode again.

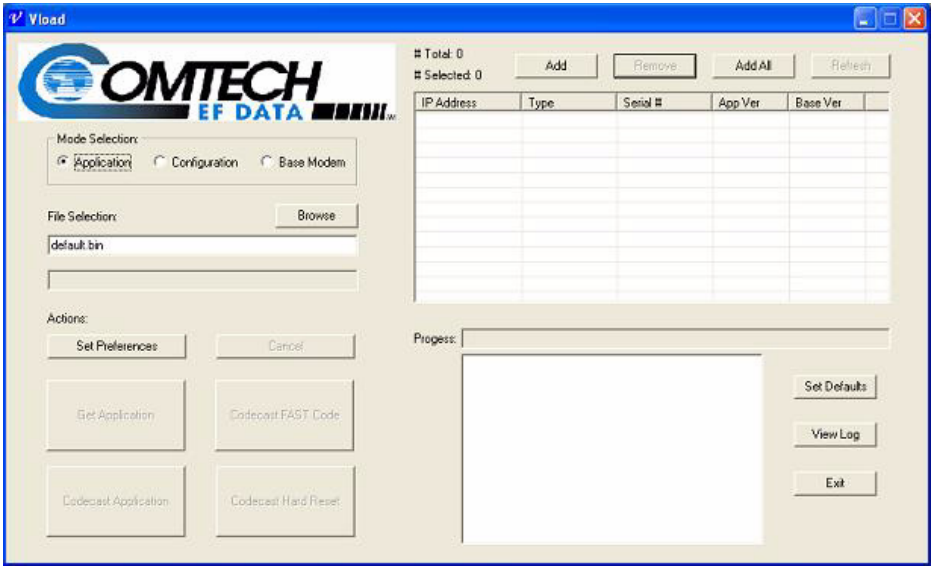

Figure 4-1 VLoad Utility, Initial Window

Select the **Set Preferences** button to open the **VLoad Preferences** dialog.

Figure 4-2 VLoad Preferences dialog

At this window, select **Digicast** and then click the **OK** button**.**

The **Digicast Media Router Remote Commander** main window will appear, as described in the following section.

Digicast Media Router Remote Commander

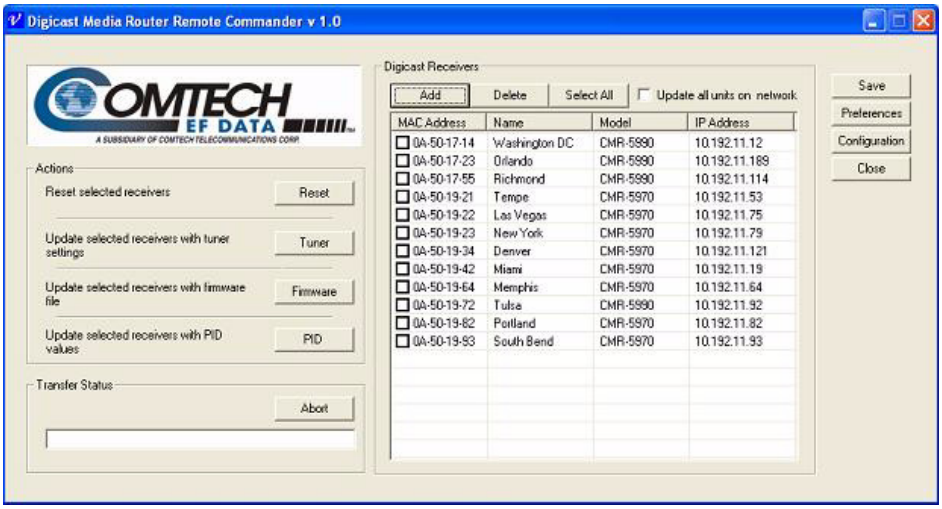

Figure 4-3 VLoad Main Window, Digicast Mode

The **Digicast Media Router Remote Commander** window allows the user to: maintain Digicast receivers, offer command functions that act upon the receivers, and navigate the program itself.

NOTE

Note: In order to individually address a Digicast receiver on a network, the receiver must be listed by its MAC address within the application.

Digicast Receivers Area on the Remote Commander

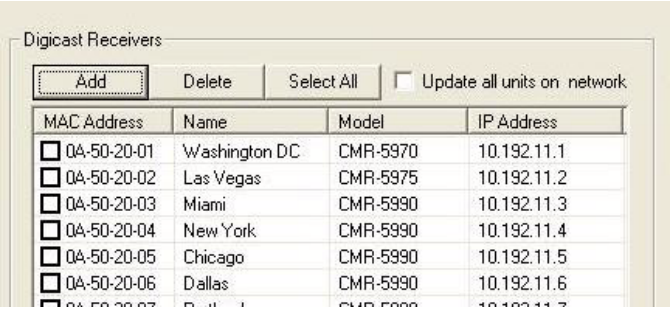

Figure 4-4 Digicast Receivers Listing / Selection box

Add

Opens a dialogue that allows the user to add a receiver to the list below shown in 3.1.1. This is required for individual addressing of remote commands.

Delete

Removes the selected receiver from the list.

Select All

Selects or unselects all receivers on the list.

Update All

Forces all receivers listening on the configured multicast address and PID to respond to a remote command.

Receiver Listing

Receivers are identified by their MAC address. Other information can be entered to assist in identifying the receiver.

Checkbox

Receivers are selected with a single left-click on the checkbox to the left of the MAC address of the receiver.

Adding a Receiver into Inventory

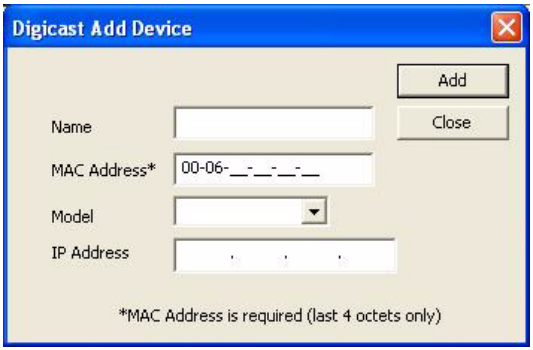

Figure 4-5 Digicast Add Device dialog

To successfully add a receiver to the Receiver Section, the user must specify the MAC address. Additional information may be entered to allow easier recognition of the receiver.

- **Name** (Optional) – Any identifying attribute that is customer defined.
- **MAC Address** (Required) – The MAC address of each individual receiver. The command package identifies the receiver through this information.
- **Model** (Optional) – The Digicast model of the receiver.
- **IP Address** (Optional) – The IP address assigned to the Digicast device. This is for customer information only.

Option Buttons Area on the Remote Commander

Figure 4-6 Digicast Option Buttons

- **Save –** Saves the changes made for adding or deleting receivers from the Digicast device inventory listing.
- **Preferences –** Option to switch between the Vipersat VLoad interface and the Digicast Remote Commander.
- **Configuration** – Brings up the Transfer Settings Configuration dialogue.
- **Close –** Closes the application.

Preferences Dialog

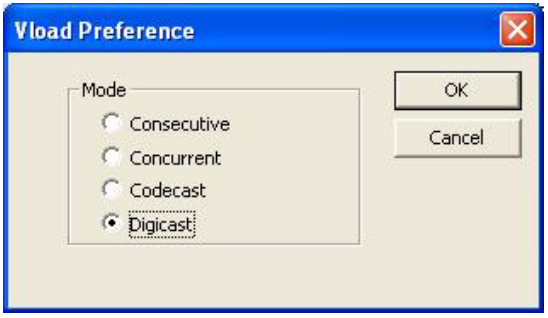

Figure 4-7 VLoad Preference dialog

The preference dialog is used to switch between the Vipersat VLoad functions, Consecutive, Concurrent, and Codecast, and the Digicast Media Router Remote Commander.

Configuration Dialog

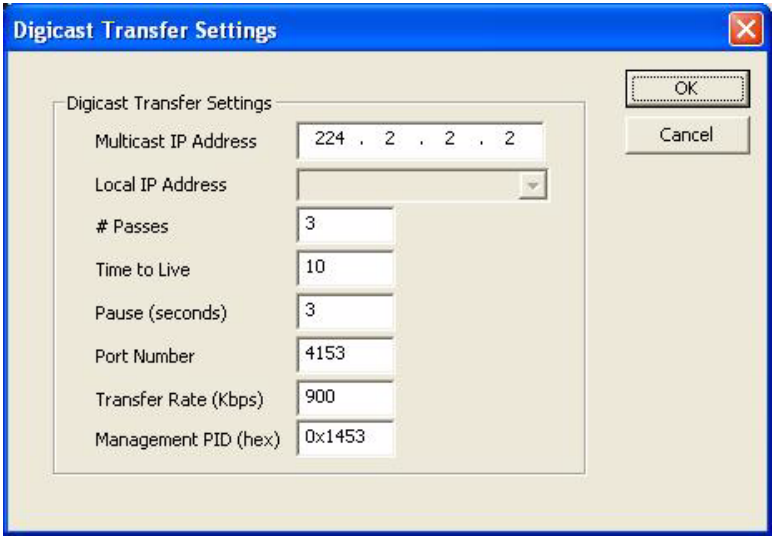

Figure 4-8 Digicast Transfer Settings dialog

The Configuration dialog is used to set the transmission parameters for the commands to be sent out to the Digicast receivers.

- **Multicast IP Address –** The multicast address to transmit out on. This address must be the same on the encapsulator and each Digicast receiver.
- **Local IP Address** – The IP address of the NIC on the computer to route the commands.
- **# Passes** – The number of times to send out the command, with each command being separated by the time specified in the *Pause* value. The number of passes is valid with each command except for the *Reset* (or reboot) command, which only sends the command once.
- **Pause** – The number of seconds to delay before transmitting the redundant command(s). This setting works in conjunction with the *# Passes* setting.
- **Time to Live –** The limit on a period of time that the transmission of a unit of data can experience before it should be discarded.

- **Port Number –** The port number on the receiving unit.
- **Transfer Rate –** The actual rate(in Kilobits per second) to transmit the outbound commands and associated data.
- **Management PID –** This is the PID that is used by the Digicast devices to receive the remote command. Each Digicast receiver and encapsulator requires that the same PID be used for management. The selection of which PID to use is at the discretion of the user. The PID needs to be consistent on all devices.

Transfer Status Area on the Remote Commander

The Transfer Status area is a visual display of the progress of the transfer command. Configuring the settings is explained in detail in the **Configuration Dialog** section.

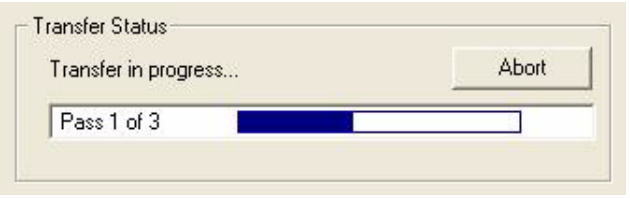

Figure 4-9 Transfer Status, In Progress

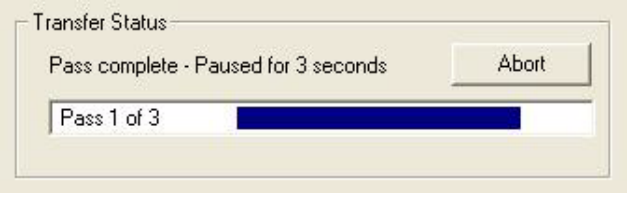

Figure 4-10 Transfer Status, Complete

Actions Area on the Remote Commander

Figure 4-11 Digicast Actions box

- **Reset –** Reboots the receivers that are selected in the receiver listing.
- **Tuner –** updates either the Primary or Secondary Tuner settings on the selected receivers.
- **Firmware –** Updates either the Application or FPGA code on the selected receivers.
- **PID –** Creates, updates or deletes the PID settings on the selected receivers.

The list of affected receivers can be selective by checking the individual receivers in the receiver list or by selecting **Update all units**, which sends out a global broadcast.

Reset

The Reset dialog differentiates from the other commands in that it does not allow multiple passes for the reset command. The reset command is sent out only once per command transfer attempt.

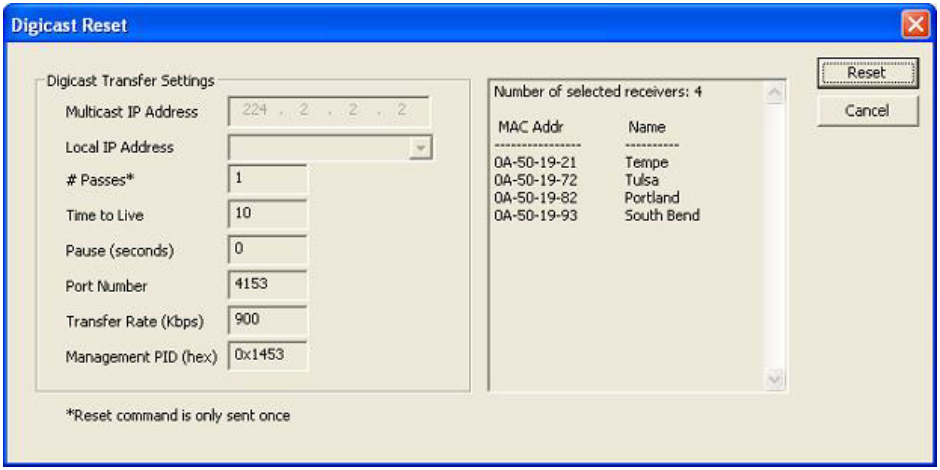

Figure 4-12 Digicast Reset dialog

- **Display of the Current Transfer Settings –** displays the current transfer settings, which can be altered in the configuration dialog.
- **Display of Selected Receivers –** includes the number of selected receivers to receive the update and their respective information.

Tuner Setting Update

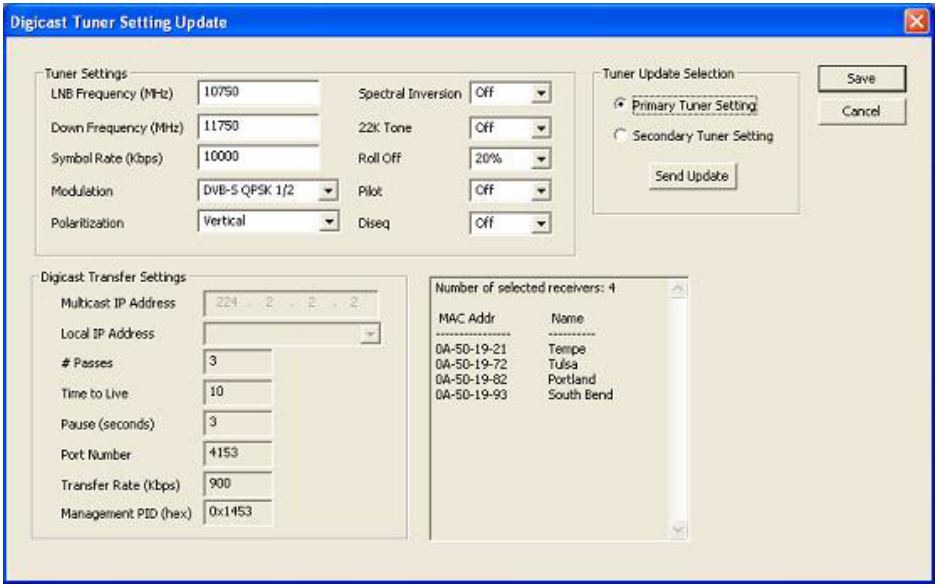

Figure 4-13 Digicast Tuner Setting Update dialog

- **Tuner Settings –** Configurable settings on a Digicast receiver.
- **Digicast Transfer Settings –** Settings used for the transfer.
- **Tuner Selection –** Allows the user to select either the Primary or Secondary when configuring the tuner settings and to implement the modified settings.
- **Selected Receivers –** A listing of selected receivers, the MAC address and the associated name of each unit selected to receive the Tuner Setting update.

Tuner Settings

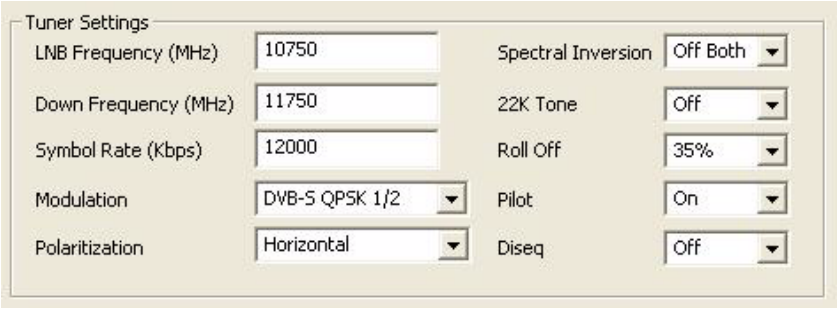

Figure 4-14 Tuner Settings box

- **LNB Frequency (MHz) –** The frequency of the Local Oscillator that resides in the Low Noise Block amplifier, located at the antenna. Review the products specification sheet or visit the manufacturer's web site for information regarding the capabilities of the Low Noise Block in use.

- **Down Frequency (MHz) –** The receive frequency being down linked from the satellite to the Low Noise Block amplifier.

  The combination of the LO and the downlink frequency produces the L-Band frequency expected by the DVB-S2 Media Receiver. To obtain the L-band frequency, subtract the receive frequency from the LO frequency. Some examples are shown below:

  Example 1

  LO = 10,750 MHz
  Ku-Band Receive Frequency = 11,895 MHz
  L-Band Frequency = 11,895 MHz – 10,750 MHz = 1,145 MHz

  Example 2

  LO = 10,600 MHz
  Ku-Band Receive Frequency = 12,010 MHz
  L-Band Frequency = 12,010 MHz – 10,600 MHz = 1,410 MHz

  Example 3

  LO = 5,150 MHz
  C-Band Receive Frequency = 3,920 MHz
  L-Band Frequency = 5,150 MHz – 3,920 MHz = 1,230 MHz

- **Symbol Rate (kbps)** – The symbol rate will depend on the configured mode of operation. The following combinations support the following symbol rates.

Digital Video Broadcast	Phase Shift Key	Msps
DVB-S	QPSK	2 – 45 Msps
DVB-S2	QPSK	6 – 32 Msps
DVB-S2	8PSK	6 – 32 Msps

- **Modulation** – The Media Receiver supports the following modes of operation:
  - DVB-S – QPSK
  - DVB-S2 – QPSK
  - DVB-S2 – 8PSK

  Each mode of operation provides a range of FEC rates that are supported based on the mode and modulation. The FEC rates can be selected through the software. The chosen setting must match on both the modulator and demodulator.

- **Polarization** – The configured polarity provides the voltage supplied to the LNB or switch. Select 13VDC for vertical polarization or 18VDC for horizontal polarization. The Media Receiver is capable of providing 500mA of current in either setting. It is recommended, that if the LNB voltage is not required, to install a DC block.

- **Spectral Inversion** – There are four supported modes of spectral inversion:

  On – forces the tuner to stay with spectral inversion. The tuner will not check for spectral inversion automatically.

  Off – forces the tuner to stay without spectral inversion. The tuner will not check for spectral inversion automatically.

  On Both – tries spectral inversion first and then attempts to automatically check spectral inversion periodically.

  Off Both – tries non-spectral inversion first and then attempts to automatically check spectral inversion periodically.

- **22K Tone** – Enables or disables the LNB 22 KHz tone to the LNB for remote LNB and switch control.

- **Roll Off** – The filter roll off of the carrier expected by the receiver. DVB-S mode uses a fixed roll off of 35%. For VDB-S2 is adjustable.

  The valid roll offs in DVB-S2 mode are:
  • 20%
  • 25%
  • 35%

- **Pilot** – Enables or disables the Pilot for DVB-S2 mode of operation only.

- **DiSEqC** – Enables sending and receiving DiSEqC commands as are supported in DiSEqC mode 1.2. The valid configuration settings for DiSEqC mode are:
  • Off
  • Mode A
  • Mode B
  • Mode C
  • Mode D

Tuner Update Selection

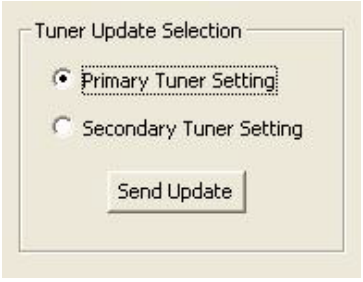

Figure 4-15 Tuner Update Selection box

The media receiver can be configured to have a secondary configuration. The second configuration will only be used by the media receiver in the event that the main carrier is unavailable.

Firmware Update

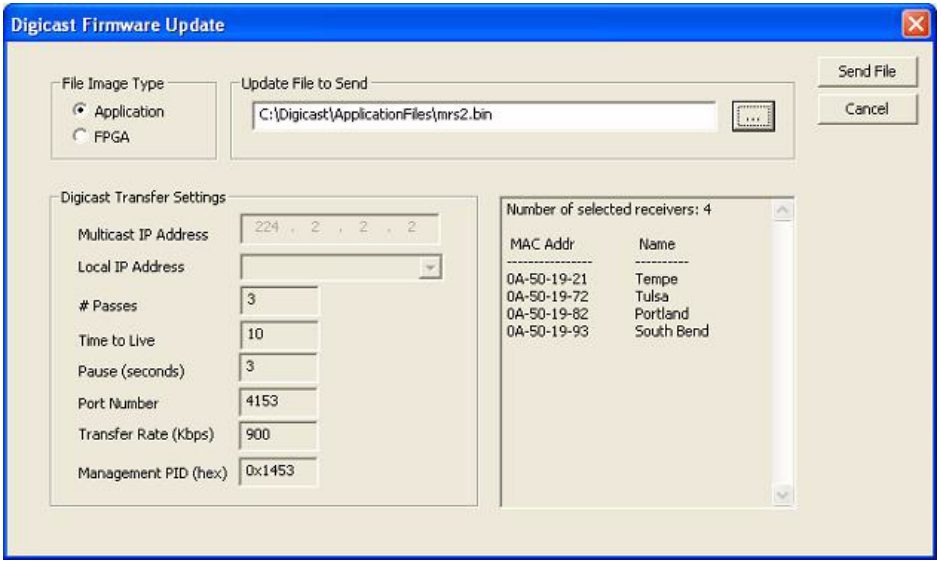

Figure 4-16 Digicast Firmware Update window

File Image Type – Allows the user to select one of the two types of files that can be sent for an update on a Digicast receiver: Application and FPGA.

File to Send – Allows the user to select the file that will be sent either from a local computer running the application or on a shared network drive.

Selected Receivers – Displays a list of receivers to receive the update.

Digicast Transfer Settings – A display of the current transfer settings. The user can change the settings by selecting the **Configuration** button located on the main Digicast Dialog window.

PID Update

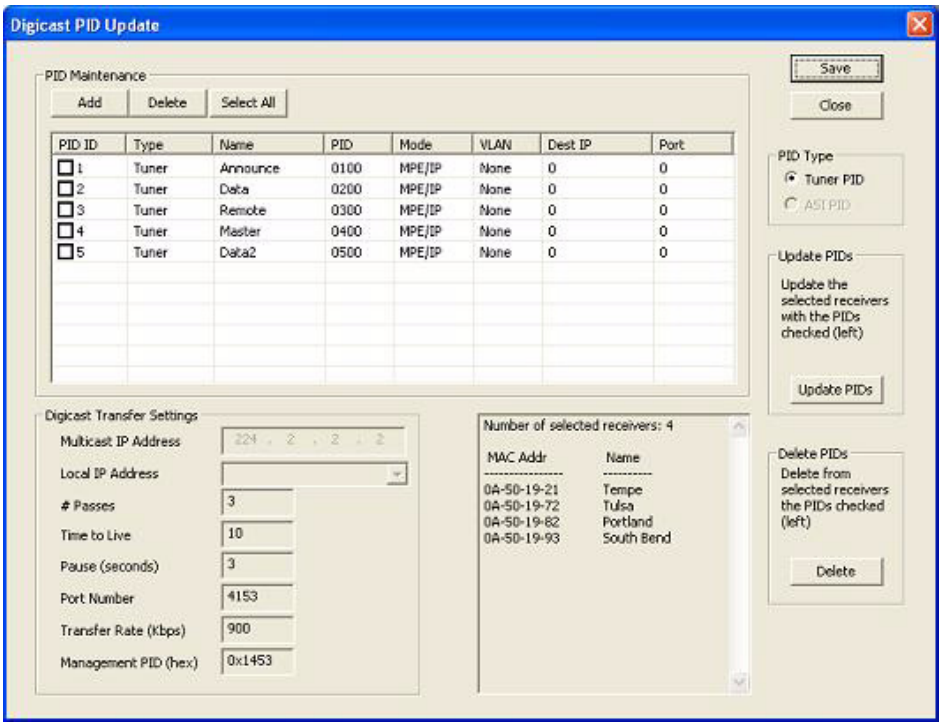

Figure 4-17 Digicast PID Update window

PID Maintenance – Allows the user to add and delete PID listings from the PID inventory listing.

Command Section – Allows the user to update or delete PIDs on the selected receivers, select PID type, save changes and close the dialog window.

Selected Receivers – Displays a list of receivers to receive the update.

Digicast Transfer Settings – A display of the current transfer settings. The user can change the settings by selecting the **Configuration** button located on the main Digicast Dialog window.

PID Commands Area

Figure 4-18 PID Commands area

PID Type – Allows the user to select either a Tuner PID or an ASI PID. In the image, only the Tuner is enabled.

Update PIDs – Allows the user to add the selected PIDs or edit the PID values on the selected Digicast receivers.

Delete PIDs – Allows the user to send the command to delete the selected PIDs from the Digicast receivers selected on the main dialog window. This command does not delete the PID from the inventory listing on this dialog.

PID Selection

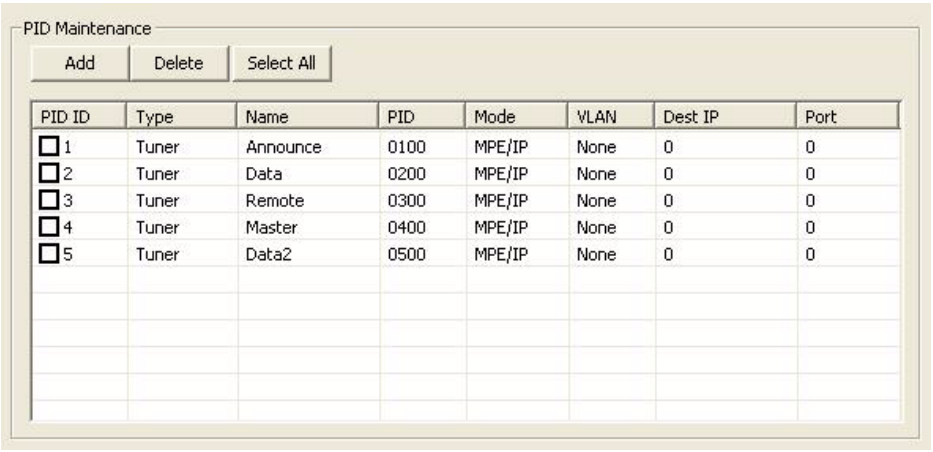

Figure 4-19 PID Maintenance box

Add PID – Allows the user to add a new PID to the PID inventory.

Delete PID – Allows the user to delete a PID from the inventory. This action only deletes from the listing. This action does not delete the PID on the selected receivers.

Select All – Allows the user to select or unselect all PIDs for the update.

Adding a PID

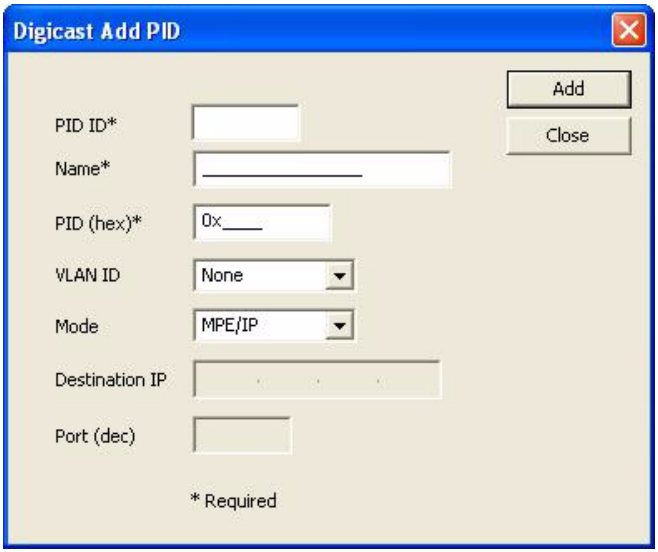

Figure 4-20 Digicast Add PID dialog

PID ID – The identifier for the PID on the receiver. The PID ID is the how to address the PID from this application to the receiver.

PID Name – A user defined identifier.

PID Value – The value of the PID in hexadecimal format.

VLAN ID – Allows the user to set the Virtual Local Area Network ID to one of the following: None, All, 4094.

Mode – Allows the user to set the Mode to either Multiprotocol Encapsulation / Internet Protocol(MPE/IP) or Digital Video Broadcasting - Transport Stream (DVB-TS).

Destination IP Address – The IP address to be used when routing the Transport Stream over the Ethernet IP.

Port – The Port Number used when routing the Transport Stream over the Ethernet IP.

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APPENDIX

A

GLOSSARY

A

ACK A signal used in computing and other fields to indicate **ack**nowledgement, such as a packet message used in TCP to acknowledge the receipt of a packet.

ARP **A**ddress **R**esolution **P**rotocol – A protocol for a LAN device to determine the MAC address of a locally connected device given its IP address. See also MAC.

ASR **A**utomatic **S**witch **R**equest – A switch request message generated by older Vipersat modems (e.g., CDM-570/L) that is sent to the VMS to establish a new satellite link or adjust bandwidth between source and destination IP addresses.

B

Base Modem The main component in a satellite communications modem that consistes of a circuit board with the modem hardware and firmware and the associeated interfaces.

BER **B**it **E**rror **R**ate (sometimes **R**atio) – A measure of the number of data bits received incorrectly compared to the total number of bits transmitted.

bps **b**its **p**er **s**econd – A measure of the bit rate or transmission speed of a digital communication link. See also *kbps* and *Mbps*.

BPSK **B**inary **P**hase **S**hift **K**eying – Sometimes referred to as 2-PSK. A digital modulation technique in which the carrier is phase shifted +/-180 degrees (two phases). The simplest and most robust of all PSKs, but unsuitable for high data-rate applications when bandwidth is limited due to encoding just one bit per symbol. See also *QPSK* and *OQPSK*.

BUC **B**lock **U**p **C**onverter – An upconverter so called because it converts a whole band or "block" of frequencies to a higher band. The IF is converted to final transmit frequency for satellite communications. The BUC is part of the satellite ODU/transceiver.

C

C-band A frequency band commonly used for satellite communications (and sometimes terrestrial microwave). For terrestrial earth stations, the receive frequency band is 3.7–4.2 GHz and the transmit frequency band is 5.925–6.425 GHz. See also *Ku-band* and *L-band*.

CDD **C**omtech **D**ata **D**emodulator

CDM **C**omtech **D**ata **M**odem

CIR **C**ommitted **I**nformation **R**ate – The guaranteed minimum bandwidth assigned to a remote terminal.

CLI **C**haracter **L**ine **I**nterface – A mechanism for interacting with a computer operating system or software by typing commands to perform specific tasks.

Codecast A network coding based ad hoc multicast protocol well-suited for multimedia applications with low-loss, low-latency constraints. Because data is streamed with no verification, high delivery ratios are obtained with very low overhead.

CRC **C**yclic **R**edundancy **C**heck – A method of applying a checksum to a block of data to determine if any errors occurred during transmission over communications links.

CXR Carrier – A radio frequency transmission linking points and over which information may be carried.

D

DAMA	**D**emand **A**ssigned **M**ultiple **A**ccess – A process whereby communications links are only activated when there is an actual demand.
dBm	**D**eci**b**el referenced to 1 **m**illiwatt.
DES	**D**ata **E**ncryption **S**tandard – A federal standard method for encrypting information for secure transmission. The Vipersat system offers 3xDES (Triple DES) for encrypting traffic.
DHCP	**D**ynamic **H**ost **C**onfiguration **P**rotocol – An Internet protocol for automating the configuration of computers that use TCP/IP.
DLL	**D**ynamic **L**ink **L**ibrary – The implementation of the shared library concept in the Microsoft Windows system.
Down-stream	In the direction of the network Remote site(s).
DPC	**D**ynamic **P**ower **C**ontrol
DSCP	**D**ifferentiated **S**ervices **C**ode **P**oint – The 6-bit field in an IP packet header that is used for packet classification purposes and is the portion of ToS that is detected by Vipersat modems.
DVB	**D**igital **V**ideo **B**roadcasting – A suite of internationally accepted open standards for digital television. DVB-S, DVB-S2, and DVB-RCS are the standards utilized by satellite services.
DVP	**D**igital **V**oice **P**rocessor – Used in packet voice applications.

E

E_b/N_0	The ratio of $\mathbf{E_b}$ (energy per bit) and $\mathbf{N_0}$ (noise power density per Hz). The bit error rate (BER) for digital data is a decreasing function of this ratio. E_b is the energy of an information bit measured in Joules or, equivalently, in Watts per Hertz.

F

FAST Code **F**ully **A**ccessible **S**ystem **T**opology Code – Designation for feature code used by Comtech EF Data for their satellite modems. The FAST method makes it easy to quickly upgrade the feature options of a modem while it is running live in the network, either on site or remotely.

FDMA **F**requency **D**ivision **M**ultiple **A**ccess – A technique where multiple users can access a common resource (e.g. satellite) by each being allocated a distinct frequency for operation. See also *TDMA* and *STDMA*.

FEC **F**orward **E**rror **C**orrection – A process whereby data being transmitted over a communications link can have error correction bits added which may be used at the receiving end to determine/correct any transmission errors which may occur.

Flash Non-volatile computer memory that can be electrically erased and reprogrammed.

Forward Path Transmission path from the Hub site to a Remote site.

FTP **F**ile **T**ransfer **P**rotocol – An application for transferring computer files over the Internet. See also *TFTP*.

G

G.729 ITU standard for LD-CELP (Low Delay – Code Excited Linear Prediction) voice encoding at 8 kb/s.

GIR **G**uaranteed **I**nformation **R**ate

Group ID A number assigned to equipment which defines it as a member of a group when addressed by the VMS burst controller.

GUI **G**raphical **U**ser **I**nterface – A form of graphical shell or user interface to a computer operating system or software application.

H

H.323 A protocol standard for multimedia communications designed to support real-time transfer of audio (such as voice over IP) and video data over packet networks. Quality of Service is a key feature of H.323. An alternative to SIP.

HDLC **H**igh Level **D**ata **L**ink **C**ontrol – A standard defining how data may be transmitted down a synchronous serial link.

HPA **H**igh **P**ower **A**mplifier – The amplifier used in satellite communications to raise the transmit signal to the correct power level prior to transmission to satellite.

HTTP **H**yper **T**ext **T**ransfer **P**rotocol – The Internet standard for **W**orld **W**ide **W**eb (**WWW**) operation.

Hub The central site of a network which links to a number of satellite earth sites (Remotes).

I

ICMP **I**nternet **C**ontrol **M**essage **P**rotocol

IDU **Ind**oor **U**nit – In a VSAT system, the satellite modem is referred to as the IDU.

IF **I**ntermediate **F**requency – In satellite systems, IF frequencies are usually centered around 70/140 MHz (video/TV), or 1200 MHz (L-band).

IFL **I**ntra-**F**acility **L**ink – The coaxial cabling used to connect the satellite ODU to the IDU. Carries the inbound and the oubound signals, and the 24 VDC for the LNB.

Image A binary firmware file that provides the operational code for the processor(s) in a network unit.

IP **I**nternet **P**rotocol – A format for data packets used on networks accessing the Internet.

ISP **I**nternet **S**ervice **P**rovider – A company providing Internet access.

ITU **I**nternational **T**elecommunications **U**nion

K

kbps **k**ilo **b**its **p**er **s**econd – 1000 bits/second. A measure of the bit rate or transmission speed of a digital communication link. See also *bps* and *Mbps*.

Ku-band A frequency band used for satellite communications. For terrestrial earth stations, the receive frequency band is in the range 10.95–12.75 GHz and the transmit frequency band is 13.75–14.5 GHz. See also *C-band* and *L-band*.

L

L-band A frequency band commonly used as an IF for satellite systems using block up/down conversion. Typically 950–1450 MHz Rx, 1250–1750 MHz Tx.

LAN **L**ocal **A**rea **N**etwork

LLA **L**ow **L**atency **A**pplication

LNA **L**ow **N**oise **A**mplifier – An amplifier with very low noise temperature used as the first amplifier in the receive chain of a satellite system.

LNB **L**ow **N**oise **B**lock – A downconverter so called because it converts a whole band or "block" of frequencies to a lower band. The LNB (similar to an LNA) is part of the satellite ODU/transceiver.

LNC **L**ow **N**oise **C**onverter – A combined low noise amplifier and block downconverter, typically with an L-band IF.

LO **L**ocal **O**scillator – A component used in upconverters, downconverters, and transponders for frequency translation (heterodyne) of the carrier signal.

M

M&C **M**onitor **&** **C**ontrol

MAC **M**edia **A**ccess **C**ontrol – A protocol controlling access to the physical layer of an Ethernet network.

Mbps **M**ega **b**its **p**er **s**econd – 1 Million bits/second. A measure of the bit rate or transmission speed of a digital communication link. See also *bps* and *kbps*.

Modem **Mod**ulator and **Dem**odulator units combined.

Multicast — Transmitting a single message simultaneously to multiple destinations (group) on the IP network.

Multi-command — A command that allows multiple input choices in a single command execution.

N

NAT — **N**etwork **A**ddress **T**ranslation – An Internet standard that enables a LAN to use one set of IP addresses for internal (private) traffic and a second set of addresses for external (public) traffic.

NIC — **N**etwork **I**nterface **C**ontroller – The network interface for a PC/workstation that provides Ethernet connectivity. Depending on the computer, the NIC can either be built into the motherboard, or be an expansion card. Some computers (e.g., servers) have multiple NICs, each indentified by a unique IP address.

NMS — **N**etwork **M**anagement **S**system

NOC — **N**etwork **O**perations **C**enter – The main control center for network operations. A NOC can interrogate, control, and log network activities for the satellite Hub as well as any Remote node.

NP — **N**etwork **P**rocessor – Also referred to as the IP Module. An optional assembly for Comtech EF Data modems that provides the 10/100 BaseT Ethernet interface that is required when used in Vipersat networks.

O

ODU — **O**ut**d**oor **U**nit – In a VSAT system, the RF components (transceiver) are usually installed outdoors on the antenna structure itself and are thus referred to as an ODU. The ODU typically includes the BUC and LNB, and is connected to the IDU/modem by the IFL cabling.

OQPSK — **O**ffset **Q**uadrature **P**hase **S**hift **K**eying – A variant of phase-shift keying using four different values of the phase to transmit. Offsetting the bit timing limits the phase shift and yields lower amplitude fluctuations as compared to QPSK, and is sometimes preferred for communications systems. See also *QPSK* and *BPSK*.

OSPF — **O**pen **S**hortest **P**ath **F**irst – An open standard interior gateway routing protocol used to determine the best route for delivering the packets within an IP network. OSPF routers use the *Shortest Path First* link state algorithm to calculate the shortest path to each node in the network. The Vipersat OSPF feature in the

Comtech SLM-5650A modem/router provides for dynamic routing functionality.

P

PLDM **P**ath **L**oss **D**ata **M**essage – A packet message that is sent by older Vipersat modems (e.g., CDM-570/L) to the VMS every sixty seconds, providing status update and operating parameter information.

PSK **P**hase **S**hift **K**eying – A digital modulation scheme that conveys data by changing the phase of a base reference signal, the carrier wave. Different PSKs are used, depending on the data rate required and the signal integrity. Examples are binary phase-shift keying (BPSK or 2-PSK) which uses two phases, and quadrature phase-shift keying (QPSK or 4-PSK) which uses four phases.

PSTN **P**ublic **S**withed **T**elephone **N**etwork – The world's public circuit-switched telephone network, digital and analog, and includes mobile as well as land-line voice and data communications.

Q

QAM **Q**uadrature **A**mplitude **M**odulation – A digital modulation technique in which the amplitude of two carrier waves is changed to represent the data signal. These two waves are 90 degrees out of phase with each other.

QoS **Q**uality **o**f **S**ervice

QPSK **Q**uadrature **P**hase **S**hift **K**eying – Sometimes referred to as 4-PSK, or 4-QAM. A modulation technique in which the carrier is phase shifted +/-90 or +/-180 degrees. With four phases, this modulation can encode two bits per symbol—twice the rate of BPSK. However, it also uses twice the power. See also *OQPSK* and *BPSK*.

R

Remote Satellite earth site that links to a central network site (Hub).

Return Path Transmission path from a Remote site to the Hub site.

RF **R**adio **F**requency – A generic term for signals at frequencies above those used for baseband or IF.

RFC **R**equest **F**or **C**omment – The official publication channel for Internet standards (such as communication protocols) issued by the Internet Engineering Task Force (IETF).

RIP **R**outing **I**nformation **P**rotocol

ROSS **R**oaming **O**ceanic **S**atellite **S**erver

RS-232 A common electrical/physical standard issued by the IEEE used for point to point serial communications up to approximately 115 kb/s.

RTP **R**eal-time **T**ransport **P**rotocol – A standardized packet format for delivering real-time applications such as audio and video over the Internet. Frequently used in streaming media systems, videoconferencing, and VoIP.

Rx **R**eceive

S

SCPC **S**ingle **C**hannel **P**er **C**arrier – A satellite communications technique where an individual channel is transmitted to the designated carrier frequency. Some applications use SCPC instead of burst transmissions because they require guaranteed, unrestricted bandwidth.

SIP **S**ession **I**nitiation **P**rotocol – A general purpose protocol for multimedia communications, commonly used for voice over IP (VoIP) signaling. An alternative to the H.323 protocol.

SNG **S**atellite **N**ews **G**athering – A satellite uplink van/truck with television crew on location conducting a live report for a newscast.

SNMP **S**imple **N**etwork **M**anagement **P**rotocol – A protocol defining how devices from different vendors may be managed using a common network management system.

SOTM **S**atellite **O**n-**T**he-**M**ove – The ability of a mobile remote terminal to roam across satellite beams to preserve link integrity and to automatically connect from one satellite and/or hub to another in a global network.

Star Topology A network topology which, if drawn as a logical representation, resembles a star with a hub at the center.

STDMA **S**elective **T**ime **D**ivision **M**ultiple **A**ccess – A multiple access technique where users time-share access to a common channel with variable-sized time slots allocated on usage.

Streamload Protocol — A proprietary Vipersat data streaming protocol.

SUM — **S**tatus **U**pdate **M**essage – A packet message that is sent by newer Vipersat modems (e.g., SLM-5650A) to the VMS every sixty seconds, providing status update and operating parameter information.

T

TCP/IP — **T**ransmission **C**ontrol **P**rotocol / **I**nternet **P**rotocol – A standard for networking over unreliable transmission paths. See also *UDP*.

TDM — **T**ime **D**ivision **M**ultiplexing – A method of multiplexing that provides the transmission of two or more signals on the same communication path or channel, but at different times by utilizing recurrent timeslots.

TDMA — **T**ime **D**ivision **M**ultiple **A**ccess – A multiple access technique where users contend for access to a common channel on a time-shared basis. See also *FDMA* and *STDMA*.

TFTP — **T**rivial **F**ile **T**ransfer **P**rotocol – A simple file transfer protocol used over reliable transmission paths. See also *FTP*.

ToS — **T**ype **o**f **S**ervice

Tx — **T**ransmit

U

UDP — **U**ser **D**atagram **P**rotocol – A standard for networking over reliable transmission paths.

UDP Multicast — A multicast transmission using the UDP protocol.

Unicast — Transmitting information/data packets to a single destination on the IP network.

Upstream — In the direction of the network Hub site.

V

VESP **V**ipersat **E**xternal **S**witching **P**rotocol – A switch-request protocol that allows external VPN equipment and Real-time proprietary applications to negotiate bandwidth requests between any two subnets on a Vipersat network. VESP is used by newer Vipersat modems (e.g., SLM-5650A) to send a switch request to the VMS to establish a new satellite link or adjust bandwidth for an existing link.

VCS **V**ipersat **C**ircuit **S**cheduler – The ArrangeLink VCS is a proprietary satellite communication scheduling system used to schedule Vipersat network resources in support of a variety of high-priority applications such as video conferencing and scheduled broadcasting.

VFS **V**ipersat **F**ile **S**treamer – A file transfer application utilizing UDP and a proprietary Streamload protocol to transmit data across the Vipersat network.

VLoad **V**ipersat **Load** Utility – A comprehensive tool for managing and distributing application, configuration, and identification information for the modem/routers in Vipersat satellite networks.

VMS **V**ipersat **M**anagement **S**ystem – A comprehensive M&C tool providing rapid and responsive control of Vipersat satellite networks. Comprised of client and server components.

VNO **V**irtual **N**etwork **O**perator – A provider of management services that does not own the telecommunication infrastructure. The Comtech Vipersat Network Products' VNO solution allows satellite space segment operators to selectively expose resources in their satellite network to other service providers, customers, or partners.

VoIP **V**oice **o**ver **IP –** The routing of voice communications over the Internet or through any IP-based network.

VOS **V**ipersat **O**bject **S**ervice – The main software service of the VMS application.

W

Wizard A specialized program which performs a specific function, such as installing an application.

WRED **W**eighted **R**andom **E**arly **D**etection – A queue management algorithm with congestion avoidance capabilities and packet classification (QoS) providing prioritization.

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